Towards fiscally feasible and efficient trade liberalization

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Abstract

Most low-income countries have experienced significant difficulties to raise non-trade taxes sufficiently to replace trade tax revenues forgone in the context of trade liberalization over recent decades. This is in contrast to nearly all high-income countries having been able to reduce trade tax revenues to very low levels while raising total revenue yields. Using an extensive database of central government tax revenues and other economic indicators for 123 countries over the period 1975-2000, various tax strategies of these countries are analyzed. Out of these countries, 101 experienced declines in their trade tax yields, of which 54 raised non-trade taxes to fully offset the loss in trade tax revenues and a further 23 managed to partially offset these trade tax losses. Out of 39 low-income countries, 28 experienced trade tax yield declines, but only 6 were able to fully replace these losses and a further 10 partially replaced the trade tax losses with non-trade taxes.

The complex structure and changes in import tariffs are reviewed to act as a basis for showing that much of the loss of tax revenues has come about through cuts in the tariffs on capital goods, raw materials and intermediate inputs, particularly in the context of the formation of trading blocs among lower income countries. This has resulted in revenue losses accompanied by higher efficiency costs from the increased import protection. It also points to one of the causes for the VAT or general sales tax (which falls on domestic consumption) having difficulty in replacing the loss of revenues from lower import duties on inputs to industry. Cases are drawn from experiences of countries in Sub-Saharan Africa. Reforms in the sequencing of trade policy changes in the formation of trading blocs and restructuring the common external tariffs back towards low, but more uniform tariff schedules are key recommendations.

The determinants of limited tax capacity in lower income countries are also estimated using the 123 country database. A particular focus on the limits arising from the large informal sectors in low-income countries that cause significant administrative and compliance cost barriers to the modern broad-based self-assessed income tax and VAT. Large informal sectors also contribute to low VAT efficiencies in low-income countries and lead to higher price responsiveness of the VAT bases in these countries. Many low-income countries introduced the VAT to replace sales or turnover taxes, and hence, already charge relative high tax rates. The combined effects of narrow VAT bases, already high rates, high price responsiveness of the base, and import duty cuts largely targeted at business inputs have limited the ability of the VAT to replace trade taxes.

With large and growing informal sectors, particularly in urban areas, in low-income countries, the importance of innovation in the taxation of the informal sector to enhance revenues and economic efficiency is emphasized. A combination of tax strategies using both indirect taxation of the inputs into informal sector through the VAT and import tariff and simple direct presumptive taxes is required depending upon the structure of an economy. To enhance cost-effectiveness, presumptive taxes should be administered by local authorities with co-ordination and oversight provided by central tax agencies.

Increased efforts should also be made to study and measure the size and nature of the informal sector in lower income countries along with the costs of tax administration and compliance in these sectors.

While the primary focus of the study is on the ability of lower income to use non-trade taxes to substitute for trade taxes, consideration is given to the full range fiscal adjustment paths that a country could follow in adjusting to the loss of trade tax revenues efficiently. These adjustments include the use of non-tax revenues and foreign aid, sub-national revenues, changing the size and organization of government, and enhancing tax administration efficiency and effectiveness.

Finally, the need for ongoing concerted work to build better, more accurate detailed fiscal data bases is noted to allow more comprehensive analyses to be undertaken of the fiscal adjustments that countries have undertaken over the long run.

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1. Introduction

Over recent decades most countries have been liberalizing their trade regimes, including reducing duties on international trade. Revenues from trade taxes as a share of GDP have fallen. Not all countries, however, have been able to sustain their overall tax revenues as a share of GDP. This is particularly the case amongst low-income countries, but also remains an issue amongst middle-income countries. The problem of trade tax revenues tends to be more acute amongst low-income countries as trade taxes tend to form a higher share of total revenues of countries with lower per capita incomes.

The difficulty of non-high income or non-industrialized countries to replace trade tax revenue losses has become recognized more sharply in recent studies such as Ebrill *et al* (1999) and Khattry and Roa (2002). The issue has been stated most starkly in Baunsgaard and Keen (2005) (hereafter referred to as B&K (2005)). They found that, based on analysis of central government tax collection data for 1975-2000 for 125 countries that, **on average**, low-income countries[1] recovered at best 30% of losses in trade taxes as a share of GDP through increased non-trade taxes, while middle-income countries recovered some 45% to 60% of trade tax losses. By contrast, high-income countries managed to more than replace any losses in trade taxes with non-trade tax revenues when measured as a share of GDP. These results are found by estimating the long-run recovery in non-trade taxes as a share of GDP from the year-to-year adjustments arising in response to changes in trade tax revenues as a share of GDP. The study also finds that the presence of a VAT does not appear to play a significant role in increasing non-trade tax revenues to replace trade tax losses. This is significant as the VAT is often presented as a tax tool to accomplish this task. Importantly, the study also recognizes significant diversity in the response of different countries to changes in trade tax revenues. For example, some low-income countries in the sample did have reasonable revenue recovery rates averaging closer to 100%, but this group only formed 6 out of the 40 low-income countries.[2] Finally, the B&K (2005) study, as do Khattry and Roa (2002), raises the issue of whether it is economically wise for low-income countries to aim for virtual elimination of trade taxes as a revenue source as has happened over recent decades with the high-income industrial countries.

This study uses the B&K (2005) data set with some minor additions as well as other data available from the authors experience in working on tax reforms with various governments, particularly in Sub Saharan Africa, to explore the nature of the importance of trade taxes and the patterns of tax adjustment that occurred both on average for groups of countries in section 2 and individually by each country in section 3. This helps

[1] The classification of countries follows the World Bank classification based on per capita GNI in 2003 US dollars: low income countries , $765 or less; lower middle income, between $765 and $3,035; upper middle income, between $3,036 and $9,385; and high income, $9,386 and above

[2] Six low-income countries estimated to have replaced trade tax losses: Benin, Côte d'Ivoire, Gambia, Malawi, Pakistan and Zambia.

motivate the recognition that tax choices are complex and, in a non-ideal world, the second-best choices that governments make in the face of complex economic structures and policies. One of the most complex tax structures is, in fact, the trade tax structure, which makes it hard to characterize with a single variable, something that Ebril *et al* (1999) discuss at length. Here the nature of trade liberalization is briefly reviewed in section 4 in order to highlight the complexity of relationships between trade tax structures, trade tax revenue and the economic efficiency consequences. Importantly, it helps highlight the new import tariff realities that are now facing many low-income countries in the context of forming regional trading blocs. The protective trade policy strategies in many trading blocs of lower income countries are leading to high revenue losses accompanied by increased economic efficiency costs.

The discussion of trade taxes forms a useful springboard to the issue of why the VAT has difficulty in acting as a revenue-replacement tax for trade taxes. In part, this arises because of the structure of tax and the fundamental difference between the bases for trade taxes and a consumption-based VAT. Another major part arises from the difficulty in raising tax revenues out of the economic structures that characterize the low-income countries, particularly the existence of large informal sectors that are difficult to tax. Section 5 goes into some detailed analysis of the tax capacity limits of lower income countries, particularly the effects of large informal sectors, as well as the implications of these economic structure limits on VAT collection efficiencies. Section 6 uses the discussion of the nature of trade taxes and liberalization strategies, along with the tax capacity limits of lower income countries to analyze the limits of the VAT to replace losses in trade tax revenues.

In the context of low-income countries with large informal sectors, the issues of the economic costs of administration and taxpayer compliance loom large and typically overwhelm considerations of the allocative economic efficiency costs of different tax policies. What are the efficient options of taxing the informal sector indirectly as well as directly? Are there other fiscal channels other than tax policy – strengthening tax administration, expenditure adjustments, non-tax revenues, foreign aid, for example – that can be used to adjust to the loss of trade tax revenues. This leads to some discussion of the fiscal options that low-income countries need to consider as well as an agenda for tax policy analysis to develop more efficient tax structures for low-income countries that reflect their structural realities with the objective of moving towards fiscally feasible and efficient trade liberalization. Section 7 discusses both the need to make trade taxes more revenue efficient, particularly in the context of the growing number of trading bloc arrangements involving lower income countries, and the need to seek ways of taxing the large informal sectors either indirectly through the VAT or import duties, or directly through efficient and effective presumptive taxes, or some combination of both approaches. Section 8 widens the scope of the analysis to recognize the range of alternative fiscal adjustment channels other than tax enhancements that a country can use to adjust efficiently to losses in trade tax revenues, including adjustments the non-tax revenues, sub-national revenues, the size and structure of the public sector, and improvements in tax administration and compliance.

Finally, section 9 provides recommendations to improve the interrelationship between trade liberalization and tax revenues, and to enhance the understanding of how to achieve more cost-effective tax administration and compliance.

2. Overview of international trends in trade tax and total tax revenue

B&K kindly made the data set used in their study available for this study. These data cover 125 countries over 1975-2000. Getting accurate tax data for a large number of countries over extended time periods is a very difficult task. This data set is described in Appendix A along with some discussion of other adjustments and issues with the data as well as related international tax databases. The sample of countries includes 59% of all countries, 81% of the world population, and 91% of the world GDP.[3] The sample includes the two most populous countries, China and India, and also all the high-income OECD or industrial countries, which account for 79% of GDP even though they only contain 15% of the world population. The main grouping of countries excluded from the sample is the transitional or former socialist countries of Eastern Europe and Central Asia as well as Russia. This results in lower representation in the upper middle-income group. For transitional economies there are problems both with getting data over the 1975-2000 period and with the major shifts in economic policy that have occurred particularly starting in the 1990s. In addition, there is low representation in the high-income non-OECD group, but this is largely formed of many small economies, which only constitute about 1% of the world population and about 2% of the world GDP.

Overall, the sample of countries can be taken as sufficiently representative to draw conclusions about major trends in trade and overall taxation across countries. It is of interest to note some regional concentrations amongst the income groupings. The low-income group is dominated in terms of number of countries by the Sub-Saharan African region forming 78% of the countries (see Table A.2 in Appendix A), but the South Asian countries within the Asia and Pacific region (India, Pakistan, Bangladesh, Nepal and Bhutan) dominate the group in terms of its population (72%) and economic size (79% of GDP). Lower middle-income countries are fairly well distributed across regions with the largest share in the Caribbean and Latin America countries in the Western Hemisphere region (34%), but the income group is dominated by the Asia and Pacific region, which includes China and Indonesia, in terms of population (80%) and size of economy (67% of GDP). The upper-middle income country sample is dominated Caribbean and Latin America countries in the Western Hemisphere region, which form about 71% of the sample by all three measures. Among the high-income OECD countries, European countries form 75% of the sample, but the countries from the Western and Asian and Pacific regions combine to contribute 66% of the economic activity in the sample. The implications of some of these weights in the country sample will become evident in the need to take some care about describing international trends or conclusions. What may be true for the average or typical country may not be true when weighted by the size of economies as being representative of what is happening in the world economy.

[3] The GDP measure used is GDP in US dollars in 2000.

Some broad trends in total tax and trade tax revenues

To get an overview of the average magnitude and variability of total tax yields (ratio of tax revenues to GDP), and yields of trade taxes (import and export taxes), the total taxes of the central governments of 123 countries in the B&K (2005) database are calculated for each year (1975 to 2000) for the countries in each of five country income groups: low, lower middle, upper middle, high non-OECD and high OECD.[4] These results are given in Appendix B along with the number of countries for which data are available in each year. The average trade tax and (total) tax yields for the countries in each income group in each year are calculated in two ways: first, the average of the country tax yields (which represents the "average country") and, second, the GDP weighted average yield (which is equivalent to the tax yield for the group of countries treated as a whole – the aggregate revenues divided by the aggregate GDP for the group). The former gives a good estimate if "country" is the unit of focus, but the latter gives a better estimate if the international magnitude of the fiscal problem for groups of countries is of interest.

A number of observations can be drawn from the Tables B.1 for (total) taxes and Table B.2 for trade taxes:

1. Total tax yields rise markedly moving from low to high income groups except for the high-income non-OECD group which contains a number of small resource rich economies relying on non-tax revenues. Only the high-income OECD country group shows a marked and consistent picture of revenue increases over the period. The reasons are discussed below.

2. Within an income group, the *country average yields* tend to be about 10% to 20% higher than the *GDP-weighted averages* meaning that there some smaller countries with higher than average tax yields, and typically the larger countries have lower tax yields. This possibly reflects in part the larger countries having higher shares of sub-national government revenues. The problems caused by the tax data only including central government revenues are discussed further in section 8 below. When all countries are taken together, the reverse happens – the typical country is only raising 20% of GDP in taxes, but the aggregate tax yield in the world is about 30% of GDP because of the dominance of the high-income economies also collecting higher than average tax yields.

3. When trade tax yields are compared across countries there is only a sharp drop amongst the high-income OECD group compared to the rest; otherwise there is no obvious pattern amongst the rest.

4. When trade taxes are compared over time, all groups on both trade tax yield averages show a noticeable decline.

[4] Brunei and Myanmar are excluded from the database for lack of some basic economic indicators. See Appendix A.

5. Average country trade tax yields are significantly higher (anywhere from 50% to 200% higher) than the GDP-weighted trade tax yields within any income group and year, except for the high income OECD group in the last few years. This reflects the occurrence of high trade tax usage amongst some smaller countries within each group that skews the distribution of country trade tax yields significantly to the right. This issue of the diversity of the use of trade taxes will be expanded upon considerably below.

6. In the earlier years of the sample, particularly, 1975-1977, tax data for a significant number of low and middle-income countries are missing and appears to be biasing the yields downwards, particularly for the trade tax yields.

7. The average magnitude of the trade tax revenue problem (in terms of revenue replacement) has dropped from around 3-4% of GDP for the low, 2%-3% of GDP for middle, and 0.5% of GDP for the high income group to around 2.5%, 1% and 0.1%, respectively. Given the total tax yields generally rise with increasing income, trade taxes as a share of tax revenues decline even more steeply. Table B.3 shows trade taxes declining from 23% of low-income country tax revenues in 2000 to only 0.4% of the tax revenues of high-income OECD countries.

The drop in trade tax revenues both as shares of GDP and as shares of total tax revenues over the 1975-2000 period begs the question of whether countries could and did replace these revenues. This question is first looked at based on the income-group average data presented in Appendix B, and then subsequently in a more disaggregated and detailed way below. In line with B&K (2005), the question of whether these trade tax revenues have been replaced by other non-trade taxes is looked at first. This assumes that governments are taking tax-financing decisions in a separable way from the broad choices of all sources of government finance. These broad choices and their impacts are raised later below.

Here, as a starter, it is assumed that governments would want to replace the trade taxes with non-tax revenues and that governments are trying to sustain their total tax yield over time. For example, one such outcome would be that the decline in trade tax yield would be completely or nearly completely recovered by raising non-trade tax revenues such that the total tax yield remains approximately constant over time. If the tax yield declines by less than the trade tax loss then partial replacement is achieved. It is also recognized that tax structure adjustments take place gradually over many years and in the short-run is subject to many economic and policy shocks. Therefore, it is reasonable to characterize countries or groups of countries by their tax yield trends over lengthy periods.[5]

[5] Estimating the trends in total and trade tax yields over the whole sample period (1975-2000) assumes that each country is following some long-term fiscal strategy over the entire period. For most countries, this appears to be a reasonable characterization, but clearly for some, the fiscal strategies changed over the period, sometimes through major policy changes, and sometimes through significant regimes changes, as occurs during and after periods of major civil conflict.

Accordingly, Table 1 summarizes the annual tax yield figures based on the simple estimated trends in tax yields over 1975-2000 and based on these trends the effective tax yields at the beginning (1975) and end of the period (2000) and at the mid-point are estimated. It also allows the shares of trade taxes in total tax revenue to be estimated. The estimated trends for low- and middle-income countries are based on 1979-2000 to avoid the significant shares of missing data in the earlier years in these groups (See Appendix B, Tables B.1 and B.2.). The estimated tax yields in 1975 and 2000 allow estimated changes in the (total) tax and trade tax yields to be estimated for the countries in each income group and check the degree of replacement.

The results presented in Table 1 show trade tax yields falling over 1975-2000 in all income groups of countries **with the largest declines in the lower income groups**. Similarly, marked declines occurred in the shares of trade taxes in total tax revenues. As above, significant differences in results arise between estimates for the average country and those weighted by the GDPs of the sample countries. Total tax yields, however, only rose for the lower middle-income and high-income OECD country groups when measured on an average country basis, and only for the high-income OECD country group when measured on a GDP-weighted base. Only the high-income OECD country group showed complete replacement of trade tax losses by both measures. High-income non-OECD showed partial replacement on a GDP-weighted-average basis, and lower middle-income countries displayed full replacement on an average-country basis, but no replacement on a GDP-weighted-average basis. The results for the low and middle-income groups are internally inconsistent and clearly the groupings are covering up some diversity in underlying tax adjustments. These are explored below.

The consistent and clear result for the high-income OECD or industrial countries is not surprising. It is consistent with B&K (2005) results and with the long-run evidence for these countries. For example, Tanzi and Schukenecht (2000) studied the public sector financial operations of the OECD countries from 1870 through 1995. This long-term study showed that up till World War I, trade taxes averaged about 1.7% of GDP and formed about 15% to 20% of revenues of all levels of government. Trade taxes then rose to about 2.2% in the 1930s, but fell to about 10% of government revenues as total revenues had doubled from around 11% to 22% of GDP from their pre-World War I levels by the 1930s. After World War II, under the co-ordination of GATT and WTO, trade taxes amongst the OECD countries declined to about 0.5% of GDP by 1995, consistent with results in Table 1 that shows trade tax yields below 0.2% of GDP by 2000. Total taxes as a share of GDP continued to increase after World War II, doubling again to about 44% by 1995. The introduction of general sales taxes, and later the VAT, increased indirect domestic taxes from about 3% of GDP to nearly 14% of GDP over the whole time period. The bulk of the total tax increase, however, came from the direct taxes, a combination of income taxes and pay roll taxes that rose to over 26% of GDP, or about double the yield of the indirect domestic taxes. Clearly, the replacement of trade tax revenues was not a revenue problem. Expansion in either income- or domestic consumption-based tax revenues far exceeded the revenue losses, though the increase in the former was about double that of the latter.

Table 1. Estimated changes in trade tax and total tax yields over 1975-2000 and degree to which trade tax revenue losses are replaced by non-tax revenues, calculated for the average country and weighted by country GDPs within each income group

	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL
Average country trade tax yield						
1975	6.27	5.48	6.56	4.97	1.13	4.19
2000	3.22	3.86	3.67	3.00	0.16	3.26
Increase	**-3.05**	**-1.63**	**-2.88**	**-1.98**	**-0.97**	**-0.93**
GDP-weighted average trade tax yield						
1975	4.21	2.83	2.94	2.28	0.48	0.66
2000	2.79	1.17	1.14	0.77	0.19	0.39
Increase	**-1.42**	**-1.66**	**-1.80**	**-1.51**	**-0.29**	**-0.27**
Average country tax yield						
1975	16.20	16.23	23.64	12.81	33.35	22.28
2000	13.10	18.59	20.36	9.97	38.59	20.15
Increase	**-3.10**	**2.37**	**-3.28**	**-2.84**	**5.23**	**-2.14**
GDP-weighted average tax yield						
1975	13.32	16.44	17.59	11.64	29.12	28.27
2000	10.00	14.31	13.88	11.27	32.70	30.11
Increase	**-3.32**	**-2.13**	**-3.70**	**-0.38**	**3.57**	**1.84**
Trade tax shares						
For average country						
1975	39%	34%	28%	39%	3.4%	19%
2000	25%	21%	18%	30%	0.4%	16%
For weighted average country						
1975	32%	17%	17%	20%	1.7%	2.3%
2000	28%	8%	8%	7%	0.6%	1.3%
Replacement of trade tax revenues						
For average country	-1%	245%	-14%	-44%	640%	-129%
For weighted average	-133%	-29%	-106%	75%	1323%	778%

LIC = Low income country; LMIC = Lower middle income country; UMIC = Upper middle income country; HI Non-OECD = High income, non-OECD country; HI OECD = High income OECD country

Tax yield = tax revenues over GDP

Replacement of trade tax revenues = (Increase in tax yield - Increase in trade tax yield) / Decrease in trade tax yield
= Increase in non-trade tax yeld / Decrease in trade tax yield

In general, this reduction in trade tax revenues among the OECD countries was a long and slow process over many decades and, for most states, started from relatively modest trade tax yields. The replacement of these forgone trade taxes was clearly a minor revenue issue for these industrial countries. The trade liberalization in the post-World War II period, however, clearly played a role in the ongoing expansion of international trade, particularly for the industrial economies until about the last decade. The IMF reports in the *World Economic Outlook Database* that from 1970 through 2005 world trade expanded consistently faster than world GDP such that world trade over world GDP rose from 23.3% in 1970 to 33.9% in 1975, to 49.6% in 2000 and 57.2% in 2005. Over most of the period the bulk of these trade benefits accrued to the advanced economies. From 1980 through 2000, the share of world GDP of the advanced economies rose from 56.4% in 1980 to a peak of 68.5% in the early 1990s, but since then has been declining to 66.7% in 2000 and 61.7% in 2005 as the rapid economic growth rates in China, India and other emerging economies have started to give these economies noticeably higher shares of the world economic activity. Similarly, the trade shares of advanced economies had risen from about 47% in 1980 to a peak of about 52% in the early 1990s and then declined to about 48% in 2000 and 42% by 2005.

The issue about the nature of fiscal response to trade liberalization and trade tax yield declines remains for the low and middle-income countries. Table 1 shows middle-income countries had trade tax yields in 2000 some two to three times higher than the high-income in 1975. In 2000, low-income countries had similar trade tax yields to middle-income countries on an average country basis, but more than twice the trade tax yield when GDP-weighted-average trade tax yields are compared. In addition, as discussed above it is clear from Table 1 that studying the fiscal adjustment on the basis of group averages for these countries is masking significant underlying diversity in their trade tax and total tax experiences over 1975-2000. Hence, the remainder of this study focuses on better understanding the diversity of fiscal experience of these countries, the difficulties these countries face in raising alternative non-tax revenues, and potential directions for improving their tax structures.

3. Disaggregated view of trade tax and total tax revenues by country

The average results above suggest that there would be benefit from looking at more disaggregated country-by-country experiences rather than group averages. Given that B&K database for 1975-2000 affords up to 26 years of observations per country, considerable information exists on the tax experience at a country level in these data.

The first issue noted above was the major difference between the country averages and the GDP-weighted averages for trade tax yields amongst low and middle-income countries. This result is expected because typically trade as a share of GDP tends to fall off as the size of an economy gets larger. This arises both because trade gets internalized

as a country or trade area is enlarged, and because the larger economies tend to be more diversified and can self supply a larger share of demand. Small countries are often highly specialized in their industrial structures, and hence, need to import a high share of inputs. For example, an island tourism-based economy tends to satisfy a large share of demand through imports. This result can be confirmed by running some simple regressions using the B&K data. See Appendix C. Goods imports as a share of GDP tend to decline with size (as measured by population and/or real GDP) and grow with GDP per capita. Trade tax yields tend to grow with goods import shares, but decline with the size of the economy (as measured by real GDP or population). Similar conclusions are drawn from observing which countries displayed high tax yields over the sample period.

As discussed above, each country is characterized by its trend rate of change of its trade tax and its total tax yields over the sample period. This allows estimates of changes in trade tax and tax yields over the sample period and the mid-point average trade tax and tax yields to be made. Initially, we are interested in the countries that on average had high trade tax yields, arbitrary defined at 6% of GDP (somewhat less than one standard deviation above the country-average trade tax yield). This nets 24 countries given in Table 2. These countries are also highlighted in Tables D.1 through D.5 in Appendix D. These countries had average trade tax yields over 6% over the sample period and, when individual years are observed, had trade tax yields of over 6% in about 18 years each on average. Twenty of these countries are islands, and all except a few are very small countries with populations of about one million or less. The remaining four (Cote d'Ivoire, Mauritania, Senegal and Tunisia) are somewhat larger countries with Tunisia being the largest with a population of about 9.5 million and GDP of US$19.5 billion in 2000.

In addition to these countries, Table 3 lists all countries with at least one year in which the trade tax yield exceeded 6% of GDP. A further 30 countries fall in this category with an average of 5 years with trade tax yields over 6%. Of these, 6 are small islands with populations of about one million or less, including Iceland, a high-income OECD country. The remainders are mostly relatively small economies with GDPs in 2000 of $10billion or less. Only five were larger, with Malaysia at $90.3billion and Egypt at $99.4 billion having the largest GDPs in 2000. Most of the incidences of high trade tax yields occurred in the earlier part of the sample period with subsequent tariff cuts reducing the average trade tax yield below 6%.

Whether these high trade tax cases for small countries makes sense in terms of the allocative efficiency and transaction costs of tax collection in the cases of the very small countries will be discussed further below. Overall it is clear, however, that this group of countries skews upwards the distribution of trade tax yields by country without being of much weight in the world economy.

Table 2. Countries with high trade tax yields on average over 1975-2000

Income group and country	Average tax yield over 1975-2000 (%)	Average trade tax yield over 1975-2000 (%)	Trade tax revenue as share of total tax revenue (%)
High income non -OECD countries			
Bahamas	16.4	10.2	62%
Upper middle income countries			
Seychelles	34.8	16.1	46%
Belize	20.5	10.8	53%
Mauritius	19.0	9.0	47%
St. Kitts & Nevis	21.3	7.1	33%
St. Lucia	22.3	7.0	32%
Lower middle income countries			
Vanuatu	20.0	14.0	70%
Kiribati	21.6	13.7	63%
Samoa	27.2	13.0	48%
Maldives	14.9	9.4	63%
Tonga	18.0	8.8	49%
Equatorial Guinea	14.7	7.7	53%
Suriname	22.3	7.5	33%
Swaziland	28.4	7.4	26%
Tunisia	24.7	7.0	28%
Low income countries			
Solomon Islands	21.4	12.5	59%
Lesotho	33.9	10.3	30%
Gambia	19.8	10.0	50%
Sâo Tomé & Principe	18.1	7.9	44%
Comoros	11.3	7.1	63%
Togo	18.6	7.0	38%
Côte d'Ivoire	19.0	6.9	36%
Senegal	16.7	6.6	39%
Mauritania	17.1	6.5	38%

.

Table 3. Countries with more than one year with trade tax yield above 6% of GDP

Country	Number of years
Fiji	13
Benin	12
Sri Lanka	11
Egypt	9
Zambia	8
St. Vincent and Grenadines	8
Malaysia	8
Jordan	8
Gabon	8
Papua New Guinea	7
Dominican Republic	7
Grenada	6
Sierra Leone	5
Namibia	4
Kenya	4
Cameroon	4
Burundi	4
Burkina Faso	4
Uganda	3
Barbados	3
Zimbabwe	2
Rwanda	2
Guyana	2
Central Afr.Rep.	2
Iceland	1
Honduras	1
Ghana	1
El Salvador	1
Congo, Rep. of	1

It should be noted, however, before leaving this group of countries that there can also be upward "biases" in the trade tax revenues to GDP of some of these countries. The bias comes from some significant external imbalances in some economies. The demand in an economy, and hence imports, depends upon the gross national disposable income (GNDI), which in some countries may be significantly higher than GDP because of a combination of net inflows of foreign transfers (whether foreign aid or nationals working abroad repatriating their wages) and/or foreign factor income. This phenomenon is most extreme in the case of Lesotho where GDNI income has often exceeded GDP by more than 50%. It is also a significant factor for economies such as Namibia and Swaziland.[6] The next step in the disaggregated analysis of the adjustments in trade and total taxes over the sample periods is to observe the changes in tax yields by each country over 1975-2000 based on the trend in the tax yields over this period. The results of this

[6] See Glenday (2005) where Table 6.7 shows GDNI-to-GDP ratios for 1992-96 and 1997-01 for Lesotho of 186.7% and 144.1%, for Swaziland of 199.4% and 112.4%, and for Namibia of 114.5% and 114.8%.

analysis for the 123 countries in the B&K sample are presented in five tables in Appendix D, one for each of the five income groups (low, lower middle, upper middle, high non-OECD and high OECD) and also divided into regional groupings (Sub-Saharan Africa, North Africa & Middle East, Asia & Pacific, Western Hemisphere and Europe.) Within each of these income and regional groups, countries are divided into three major patterns of trade tax and total tax yield adjustment over the sample period, only one of which corresponds to the trade tax revenue reduction with replacement by non-tax revenue increases.

The three patterns of tax revenue adjustments observed from the trends in tax yields are:

1. **Trade tax yield reduction with either complete or partial replacement by non-trade taxes.** Complete replacement is observed when the change in trade tax yield is negative, but change in total tax yield is positive. Partial replacement is observed when the reduction in total tax yield is less than the reduction in the trade tax yield.
2. **Both trade tax yields AND non-trade tax yields declined.** These cases are observed when the trade tax yield was reduced, but the reduction in total tax yield was even higher.
3. **Trade tax yields increased, with either an increase in total tax revenues or a decrease in total tax revenues.** Where total tax yields rose, the trade taxes either completely offset a non-trade tax decline or contributed to increase in all tax revenues. Where total tax yields declined, the trade tax yield increases offset some of the decline.

The detailed country-by-country results for the tax yield trends over the sample period are provided in Tables D.1-D.5 in Appendix D and summarized in Table 4 below. These disaggregated results show a significant diversity of trade and total tax adjustment across countries, but some trends can be observed as well. Out of the 123 countries, 101 or 82% of countries decreased trade tax yields over 1975-2000, but the remaining 22 actually increased their trade tax yields. Out of those with trade tax yield decreases, 54 completely replaced the trade tax revenue losses and experienced increases in total tax yields, 23 partially replaced these losses and had declines in total tax yields, and the remaining 24 had decreases in non-trade taxes as well, and hence, had declines in total tax yields. Out of the 22 with trade yield increases, 14 countries had increases in total tax yields so that the trade tax increases contributed to these total tax increases, while the remaining 8 had declines in total tax yields so that the trade tax increases partially offset these declines. It is further interesting to note that **only 68 countries showed increases in total tax yields**. While 91 countries increased their non-trade tax yields, in 23 of these cases (the partial replacement cases) it was not sufficient to offset the trade tax declines. Overall in 47 countries trade tax yield declines "contributed" to the overall decline of total tax yields, while a further 8 countries had total tax declines despite trade tax increases.

Table 4. Distribution of countries across income groups and regions in terms of total and trade tax adjusment experience over 1975-2000

Income Class and region	Number of countries	Change in Trade Tax Revenue over GDP over 25 years (%)	Number of countries	Change in Trade Tax Revenue over GDP over 25 years (%)	Replacement rate = Increase in non-trade taxes offsetting decrease in trade taxes	Number of countries	Change in Tax Revenue over GDP over 25 years (%)	Change in Trade Tax Revenue over GDP over 25 years (%)	Contribution rate of trade tax increase to tax loss	Number of countries	Change in Tax Revenue over GDP over 25 years (%)	Change in Trade Tax Revenue over GDP over 25 years (%)	Trade tax contribution to tax increase (or reduction in tax loss)
	Trade tax decrease with non-trade tax replacement						**Trade tax decrease AND non-trade tax decrease**				**Trade tax increase**		
	Complete replacement		**Partial replacement**										
High income, OECD													
Sub-Saharan Africa													
N. Africa & Mid East													
Asia & Pacific	4	-0.9											
Western Hemisphere	2	-0.7											
Europe	15	-1.1				3	-3.3	-0.4	28%				
Total	**21**	**-1.0**				**3**	**-3.3**	**-0.4**	**28%**				
High income, non-OECD													
Sub-Saharan Africa													
N. Africa & Mid East			2	-0.3	41%								
Asia & Pacific													
Western Hemisphere	1	-1.8	1	-1.9	9%								
Europe													
Total	**1**	**-1.8**	**3**	**-0.9**	**31%**								
Upper middle income													
Sub-Saharan Africa	2	-2.4	1	-3.4	58%	1	-5.9	-4.6	78%				
N. Africa & Mid East										1	-11.0	0.5	-4%
Asia & Pacific			1	-6.0	14%								
Western Hemisphere	4	-3.4	5	-5.0	59%	4	-8.2	-0.6	26%	2	-4.6	0.6	-28%
Europe													
Total	**6**	**-3.1**	**7**	**-4.9**	**52%**	**5**	**-7.8**	**-1.4**	**36%**	**3**	**-6.7**	**0.6**	**-20%**
Lower middle income													
Sub-Saharan Africa	4	-4.5				1	-12.2	-6.0	49%	3	-2.9	0.6	-4%
N. Africa & Mid East	4	-3.2											
Asia & Pacific	6	-4.7	1	-12.4	85%	2	-4.4	-1.1	26%	2	8.3	6.2	76%
Western Hemisphere	6	-1.8	2	-6.1	68%	1	-5.4	-4.8	89%	3	2.8	0.9	30%
Europe													
Total	**20**	**-3.5**	**3**	**-8.2**	**73%**	**4**	**-6.6**	**-3.2**	**47%**	**8**	**2.0**	**2.1**	**29%**
Low income													
Sub-Saharan Africa	3	-2.4	9	-7.2	53%	11	-11.9	-3.5	36%	7	3.1	2.4	67%
N. Africa & Mid East	2	-2.2											
Asia & Pacific	1	-3.8	1	-1.6	49%					4	3.8	0.9	5%
Western Hemisphere						1	-6.4	-3.4	53%				
Europe													
Total	**6**	**-2.6**	**10**	**-6.7**	**53%**	**12**	**-11.4**	**-3.5**	**37%**	**11**	**3.3**	**1.9**	**44%**
All countries													
Sub-Saharan Africa	9	-3.3	10	-6.8	53%	13	-11.4	-3.8	40%	10	1.3	1.9	45%
N. Africa & Mid East	6	-2.8	2	-0.3	41%					1	-11.0	0.5	-4%
Asia & Pacific	11	-3.3	3	-6.7	49%	2	-4.4	-1.1	26%	6	5.3	2.7	29%
Western Hemisphere	13	-2.1	8	-4.9	55%	6	-7.5	-1.8	41%	5	-0.2	0.8	7%
Europe	15	-1.1				3	-3.3	-0.4	28%				
Total	**54**	**-2.0**	**23**	**-5.6**	**52%**	**24**	**-8.4**	**-2.6**	**34%**	**22**	**1.5**	**1.8**	**30%**

The reasons for these total tax declines can be various. In some cases it is likely a policy choice was made to either downsize government or replace taxes with other sources of revenue, such as natural resource revenues. These cases are likely amongst the high-income countries, and possibly many of the middle-income countries. Amongst the low-income countries, however, tax performances of a number of countries were clearly affected by varying degrees of severe civil disturbance, major regime changes and/or gross economic mismanagement. Outside of these causes, then there remains the issue of to what extent many countries are constrained by structural features of their economies, such as large informal sectors, to be able to replace trade tax losses with domestic taxes. These issues of "tax capacity" limitations on low and also many middle-income economies are addressed in some detail in section 5.

Are there any obvious trends in tax adjustment in moving from the high to low income groups of countries? The high-income OECD countries at the one extreme have a fairly uniform experience with 21 countries displaying complete replacement as fairly modest reductions in trade tax yields of about 1% was more than replaced by large increases in non-tax revenues, but 3 countries (Iceland, Luxembourg and the Netherlands) reduced their total tax yields along with trade tax yield reductions. At the other extreme, low-income countries displayed a wide range of tax adjustments. Out of the 39 low-income countries, only 6 managed complete replacement, but a further 10 replaced 53% of the trade tax yield loss. This performance is somewhat more optimistic than the B&K(2005) analysis would suggest, but still these 16 only represents 41% of these countries.[7] A further 12 countries had losses in both trade tax and non-trade tax yields. This group contains many of the economies subjected to severe disruptions noted above, but fortunately a number of these are now emerging with improved governance and economic management, and hence, are no doubt now on different tax adjustment paths. Finally, out of the 11 countries with trade tax yields increases, in 8 cases this contributed to increases in total tax and in the remaining 3 cases it offset total tax decreases. Among the low-income group, therefore, 25 experienced trade tax yield declines, but only 14 experienced total tax yield increases, and in 8 of these cases trade taxes were used to boost the total tax yield increases. This suggests persistent difficulties in raising non-trade tax yields among the 24 countries that showed increased non-trade tax yields, but with only 6 being sufficient to completely replace the lost trade tax revenues.

The lower middle-income group displayed a relatively good adjustment performance with 20 out of 35 countries (or 57%) showing complete replacement and a further 3 with 73% replacement of trade tax losses. This is again somewhat better than expected from the B&K (2005) analysis based on their basic adjustment model. B&K, however, did take their analysis a step further to recognize that countries may adjust differently to trade tax

[7] Note that the B&K(2005) measure of long-run tax adjustment in response to reductions in trade tax revenues holds the income and structure of the economy constant, and hence, removes the tax yield increases that would be gained from real economic growth and structural development of an economy. As discussed in section 5, economic growth does not necessarily lead to higher tax yields (taxes as a share of GDP may remain constant or even decline), but if economic growth is accompanied by structural changes that enhance the tax capacity of a country (such as large formal sectors) as happens particularly with lower middle income countries, then non-trade tax yields can grow and offset trade tax cuts even without tax policy changes.

yield increases compared to decreases. In the case of middle-income countries, when trade tax decreases were separated from increases, these countries managed almost exactly to replace trade tax yield decreases with non-trade tax yield increases.

As noted above, there are major differences in trade and trade tax experiences of very small versus very large countries. Focusing on the high trade tax yield cases, in Table 3, while their tax adjustment experiences were diverse, they managed to completely replace trade tax losses in 12 cases and partially replace them in a further 6 out of the 23 countries with a higher share of the complete replacement cases among the higher income countries. Total tax yields improved in 13 of these countries. Overall this tax adjustment experience by the high trade tax yield countries, typically very small countries, is somewhat better than the overall sample. At the other end of the spectrum, the very large countries (excluding the high-income OECD countries) such as China, India and Indonesia all had "abnormal" tax adjustment experiences over 1975-2000. China and Indonesia (both LMICs) experienced reductions in both trade and non-trade tax yields. India, by contrast increased its trade tax yield that partially offset a decline in non-tax revenues. All 3 countries, therefore, experienced declines in total tax revenues. These trends are no doubt reversed in more recent years as rapid economic growth is boosting domestic taxes in India and China. These large country experiences clearly can dominate the weighted-average tax adjustment results and mask the experiences of smaller countries. Over issues are also raised later about the importance and changing roles of sub-national government revenues. The central government revenues in these large economies may be giving an inaccurate view of the actual fiscal adjustment experiences. This topic is raised further in section 8.

The disaggregated results of the individual country tax adjustment experiences over 1975-2000 reveal a more complex experience than a simple trade-off between trade and non-trade taxes to maintain tax yields. Interestingly, for some 44% of the countries in the sample their total tax yields were on a downward trend over 1975-2000, which is why the change in the country average total tax yield for all countries in Table 1 is negative. By contrast, with tax yields for most of the high-income economies rising over the period, the change in the weighted average total tax yield was positive. By disaggregating the country experiences, a somewhat improved adjustment performance by the lower income countries is revealed when this is not masked by some of the countries that are not on replacement trajectory. It is still clear, however, that the problems of raising non-trade or domestic taxes rise as the income level of a country declines. In addition, while most countries decreased their trade tax yields over this period, 18% of the countries in the sample increased their trade tax yields to boost overall tax revenues or offset non-trade tax declines. The issues of the constraints on domestic revenues and how far and fast should low and middle income countries should go in lowering trade tax yields remains to be discussed. Before tackling those topics, it is important to note some basic issues about the current nature of trade taxes.

4. Trade taxes and trade liberalization strategies

As mentioned above, many empirical analyses of trade taxes and models of the economic effects of trade taxes tend to reduce trade taxes into excessively simple measures that mask the underlying complexity of trade taxes and their effects on the economy. When studying trade tax revenues, summary measures such as the trade tax yield (trade tax revenues over GDP) or the country tax rate (import duties over the value of imports) are often used. Similarly, in modeling the economic effects of trade taxes and other indirect taxes, trade taxes are often represented by a single tax rate on some final imported good. In practice, the bulk of trade taxes typically arise from a complex import tariff schedule overlaid with complex exemption and bonding structures. Many countries use about six thousand harmonized system codes to classify imports and apply a range of duty rates to these. Imports are similarly a complex range of goods, often dominated by raw materials and intermediate inputs rather than some set of final consumption goods. Hence, the same trade tax revenue yield can be collected from a variety of tariff schedules and be associated with a wide range of economic effects. Indeed, it is not necessarily the case that a lower trade tax yield means a lower economic efficiency cost from trade taxes. For example, a wider dispersion of trade tax rates typically leads to more costly economic distortions than if the rates are in a tighter band, and yet the revenue yields may be similar or even higher in the latter case.

Table 5 illustrates the composition of imports in a selection of countries across income groups as well as regions and country sizes. No clear pattern emerges, from these data given the wide range of industrial structures in the counties. It is evident, however, that final consumption goods (which include consumer goods, food and beverage items primarily for households, passenger motor and non-industrial vehicles and automotive fuels) typically fall in the range of only 20% to 40% of imports. In a few cases, often small economies, the consumption goods share is higher. Countries with the highest consumption good shares in this selection include Iceland, St Lucia, St Kitts and Nevis, Jamaica, Maldives, Gambia and Suriname. The large countries such as China, India and Indonesia all have low shares of consumption imports. These results are fairly consistent with the observation above that most of the highest trade yield countries were small countries.

Recognizing the complex natures of trade taxes and imports is important for two reasons. First, it is likely, and arguably efficient for many lower income countries to retain a certain level of trade taxes over the foreseeable future to sustain their revenues. The reasons will be developed further below to the extent they are not already evident. If this is the case, then it is important that they be charged in an economically efficient manner. Some of the recent trends that can be observed in the structure of import tariffs, however, are moving many low-income countries away from efficient import tariff structures. Second, as will be discussed later, the complexity of tariffs and composition of import trade are a contributing factor to the difficulties that the VAT has had in playing the role of a substitute source of revenue.

Table 5 Composition of imports by broad categories of economic use for a selection of countries in different income groups, 2000

Country	Import shares by broad classification of economic use in 2000		
	Consumption	Capital equipment and parts	Raw materials and intermediate inputs
High income countries			
Australia	27%	40%	33%
Austria	26%	37%	37%
Bahamas	39%	19%	42%
Bahrain	20%	12%	68%
Belgium	24%	25%	50%
Canada	21%	48%	31%
Germany	36%	32%	32%
Iceland	40%	35%	24%
United Kingdom	30%	37%	32%
USA	33%	36%	31%
Upper middle income countries			
Argentina	20%	42%	38%
Botswana	31%	30%	38%
Belize	36%	27%	38%
Chile	25%	32%	43%
Malaysia	11%	63%	26%
Mauritius	33%	20%	47%
Saint Lucia	48%	22%	31%
Saint Kitts and Nevis	43%	24%	34%
Lower middle income countries			
Bolivia	29%	35%	36%
China	7%	42%	51%
Indonesia	16%	28%	56%
Iran	9%	38%	53%
Jamaica	47%	19%	34%
Maldives	50%	21%	29%
Philippines	10%	52%	39%
South Africa	24%	36%	40%
Swaziland	38%	26%	36%
Thailand	9%	45%	46%
Low income countries			
Bangladesh	13%	15%	72%
Gambia	58%	11%	31%
Ghana	25%	24%	51%
India	8%	17%	75%
Kenya	24%	26%	49%
Lesotho	35%	9%	56%
Malawi	20%	30%	50%
Senegal	28%	20%	52%
Suriname	40%	28%	32%
Uganda	39%	24%	37%

Source: UN Comtrade Database

Imports are grouped by Broad Economic Categories (BEC): Consumption, BEC = 112, 122, 6, 7, 51, 522, 321, Capital equipment and parts , BEC = 4. 521, 53, and Raw materials and intermediate inputs, BEC = 111, 121, 2, 31, 322

As is evident from results presented above (Tables 1 & 4 and in Appendices B and D), based on the observed declines in trade tax yields, trade liberalization has been widespread and persistent across most countries and regions. As has been discussed extensively elsewhere, trade liberalization has been more than a lowering of duty rates. It has importantly included removal of quotas and foreign exchange allocation regimes in conjunction with relaxations of foreign exchange, capital market and domestic price controls. The phenomenon of extremely high import duty rates is now more rare. While this liberalization process had gone on in higher income countries over a number of decades, it was more concentrated in the late 1980s and 1990s in most of the developing countries.

In the early stages, trade liberalization can lead to increased revenues as trade expands with freer access to foreign exchange, quotas are replaced by tariffs, and high duty rates are lowered, particularly where these rates were reduced from prohibitively high and often unenforceable levels. In addition, many studies were conducted in the 1970s and 1980s analyzing the complex and perverse incentive structures arising out of the cascading tariff structures. In response, considerable emphasis was placed on moving tariff structures towards uniform tariff rates through radial compression of the import tariff schedules (essentially gradually raising the lower duty rates and lowering the higher ones towards some mid level rate, or at a minimum, two or three rates in a fairly tight rate band.) Studies of the potential revenue and economic efficiency gains of radial compression were common and guidelines advocating the benefits of such policies were prepared. See for example, Harberger (1988).[8] It is useful to emphasize one of the critical benefits of radial compression. While revenue and efficiency benefits can be gained from lowering high rates, the gains arising from raising duty rates on imported inputs were more critical. Rate increases on imported inputs typically raise revenues and offset the subsidy effect in the output production and lowered the effective protection provided.

Unfortunately, over the past decade trends in trade liberalization have dramatically departed from these principles in many countries under the pressures and procedures arising from establishing the many regional trading blocs arising around the world. While average tariff rates are lower, a trend towards high effective rates of protection has remerged. This is evident at least in the Sub-Saharan African region from the author's experiences.

As part of trade liberalization and attempts to create larger and more efficient markets, there has been a proliferation of regional trading blocs, most with some medium term goal of establishing regional customs unions or common markets. Ultimately these trading blocs would establish a common external tariff (CET) for their region, and all trade within their region would no longer be treated as international trade for customs purposes – no import duties would be charged on trade between member states, but also no export incentives would apply to such trade. The sequence of policy changes that has

[8] Arnold C. Harberger, *Trade Policy and the Real Exchange Rate*, Economic Development Institute, World Bank (March 1988).

been undertaken in establishing these regional trading blocs has typically been slow and involved lowering importing duties on trade between member states before establishing a CET and removing favorable treatment of exports. This sequencing has been the case in the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC) and the East Africa Community (EAC) over the past decade or so. Under the Cross Border Initiative (CBI) donor agencies provided aid incentives to accelerate the reduction in duty rates on trade between member states. By the late 1990s and early 2000s, internal tariff rates had been lowered significantly between COMESA members, and SADC arrangements are similarly now underway with a target of eliminating import duties on trade between member states substantially by 2008 and completely by 2012.

The goal of establishing a common market with a CET is to promote trade and investment in the region, with investment incentives largely neutral within the region, at least in terms of effective rates of protection. Unfortunately, over recent years the sequencing of liberalization has led to perverse investment incentives. Aside from the issue of different tariff schedules among member countries providing different effective rates of protection, the continued eligibility of exporters within the region for export incentives made it more attractive to move investment to a neighboring country to supply a domestic market. For example, a domestic producer in one country could be paying duty on imported raw materials, but a producer in a neighboring country under various export platform provisions may get duty free raw materials (whether operating out of an export processing zone or receiving duty exemptions or drawbacks on imported raw materials used to supply the exports) and then export into the country without any tariff barrier. Without a CET and allowing preferential export treatment within the region, domestic firms have effectively been faced by unfair import competition from within the region. As a result they put pressure on their own governments to remove this distorted situation. Without the power to effect the regional structure individually, member countries have taken the only other alternative, namely to lower the duty rates on the imported inputs of affected industries, thereby putting them back on a level playing field with the export competition from within the region but effectively increasing the effective rates of protection within the region and at the same time forgoing import duties.

Kenya can be used as a case study of how dramatic these effects can be arising from the unfortunate sequencing of trade policy changes on the import revenues and trade distortions of the country. For about a decade prior to 1997/98, Kenya had been implementing a program of trade liberalization, including market liberalization, radial compression of import tariff rates and major strengthening of customs administration. These are detailed in Glenday (2002) and Glenday and Ryan (2003).[9] Effectively Kenya

[9] Glenday, Graham "Trade Liberalization and Customs Revenues: Does trade liberalization lead to lower customs revenues? The Case of Kenya," Journal of African Finance and Economic Development , Autumn 2002, 5(2), 89-125; Glenday, Graham and T.C.I. Ryan "Trade Liberalization and Growth in Kenya," in *Restarting and Sustaining Economic Growth in Africa: the Case of Kenya*, edited by M. S. Kimenyi, J.M. Mbaku, and N. Mwaniki, Contemporary Perspectives on Developing Societies (Ashgate 2003) Chap 5

had managed by the mid-1990s to more than halve its effective import duty rates, but double its import duty revenue yield. In 1997/98, Kenya was planning a further step in import tariff rate compression to bring its top rate down from 35% to 25%. At the same time, however, political pressures from manufacturers that were becoming increasingly exposed to competition from within the COMESA region were escalating. In fact, Egypt had joined COMESA and had a similar mix of manufacturers to Kenya a well as many of them operating out of export processing zones. Kenyan manufacturers effectively recaptured the political initiative by demanding and gaining increased trade protection. While the overall rate schedule was adjusted downwards as planned, local industry was awarded a series of temporary additional duties on competing imports and, more importantly, Kenya started a series of cuts in the tariffs on the imported inputs of manufacturers that continued for a number of years. These raw material and intermediate input values formed high shares of the total imports, and hence, were costly in terms of both revenues and economic distortion costs. By 2000/01 the cumulative effect of these duty cuts resulted in the standard VAT rate having to be raised from 15% to 18%, a major rate increase to offset the trade tax revenue losses that were not generating efficiency gains, but, in fact, were moving in the opposite direction of the Harberger-style proposals of trade tariff compression of a more than a decade earlier.

Similarly, policies of low or no tariffs on imported inputs – capital goods, raw materials and intermediates – of the major domestic industries have emerged in many Sub-Saharan African countries which are faced by these internal distortions within the trading blocs as they are being constructed. These low rates have become the starting point for negotiating a CET. Interestingly, Uganda during the 1990s was convinced of the merits of a uniform tariff structure, but it appears that this goal maybe lost in the process of establishing a CET with EAC and/or COMESA. COMESA is still struggling to establish a CET (as are the EAC and SADC). To date, the only part of this CET that COMESA has agreed to is duty rates in the 0% to 5% for capital equipment and raw materials. The rate structure for intermediate and final goods is not agreed. Indeed, the detailed classification of specific goods to these broad categories will cause problems in negotiations of a CET given different industrial structures and different interests in protecting the existing structures. For example, a country with a pulp and paper production industry will regard paper and board as a finished product whereas other countries will see them as intermediates.

The formation of trading blocs can result in trade tax revenues being lost as the trade barriers between countries drop. This occurs both through trade diversion as regional production displaces dutiable imports from outside the region, and, as discussed above, further through the pressures to move away from radial compression of duty rates, particularly the large losses from lowering duties on imports of major industrial inputs. Table 5 above shows the importance of capital, raw material and intermediate inputs in the typical import composition of low and middle-income countries. There is a clear agenda here to reform the policy sequencing of the formation of trading blocs as well as to re-establish the policy goal that more uniform tariff structures are more efficient in collecting revenues and less distortionary.

5. Limits on tax capacity in low-income countries

The size of government (or total government expenditures as a share of the economy) is a matter of public choice, but this choice is constrained particularly for lower income countries by the characteristics of an economy that affect the feasibility and costs of raising sustainable revenues to finance government operations. Certain features of an economy make for more or less cost-effective revenue raising efforts.

Features that have low administrative and compliance costs of revenue collection are typically referred to as "tax handles." Good tax handles include imports forming a high share of the economy, most imports entering through well-controlled sea, air or rail ports, large formal sector mining operations, and a large share of business activities being conducted in large formal sector corporations. By contrast, other features of an economy can make for difficult tax collections. These include a large non-monetary or subsidence agriculture sector, a large informal or micro-business sector with poor books and records, a weak accounting profession, and low levels of literacy and numeracy which undermine the ability of the private sector to self-assess taxes such as income tax or VAT. These types of structural characteristics affect the "tax capacity" of a country or the feasibility of a country to administer different types of tax.

Historically, all countries' tax systems were limited to the feasible tax handles, typically taxing trade at ports and city gates, or taxing specific types of domestic production – the origins of "customs and excise." As discussed in section 3 above, the twentieth century saw the emergence of the broad-based taxes in the high-income OECD countries that generated the revenues currently observed in these countries. The growth in revenue yields of the public sector that resulted in these countries now averaging around 45% of GDP (with a spread of about 10 percentage points around this mean) depended upon two key structural features developing in these economies. First, the growth in labor income in terms of both the wage rates earned and the number of workers earning high enough amounts to justify taxing increasingly high shares from their income. Second, the emergence of companies offering formal employment arrangements and maintaining accounts in a way that the efficient payroll deduction and PAYE systems became feasible for most workers. These deductions at source from payrolls now form the backbone of revenue collections. Formal business entities also allowed the corporate income tax, the broad-based sales tax, and later the VAT to be implemented. Most developing and emerging economies have inherited or adopted these broad based taxes, but the underlying structural features of these economies only allow these taxes to apply in limited parts of their economies. For low-income countries the choice of a government collecting 50% of GDP in revenues, for example, is not an option. Hence, exploring the nature of these constraints is important.

The impact of the structural features on the tax capacity of a country shows up strongly when the level and composition of central government revenues are compared across different groupings of countries at different per capita income levels. Table 6 gives the level and composition of central government revenues from the World Bank World

Development Indicators (WDI) for 1997 or 1998 for groupings of countries according to per capita income.[10] These results show that overall central current revenues rise from the low-income group at 13.4% of GDP to the high-income group at 28.4% of GDP (and 36.9% of GDP among the European Monetary Union countries) in 1997-98. Tax on international trade at 25.8% of current revenues is important among low-income countries, but is negligibly small among high-income countries. Taxes on goods and services are important among all country groupings. Taxes on income, and especially social security taxes (which are generally payroll or employment taxes), however, rise sharply from the low-income countries to the high-income countries. Combined income and social security taxes form only about 20% of current revenues among low-income countries, but rise to nearly 50% among high-income countries and about 64% among the European Monetary Union countries.

These patterns reflect both the need for low-income countries to rely on tax handles (such as border collections on trade) and the difficulties of collecting direct taxes that require both formal business accounting practices and income levels of individuals to be high enough above some minimum threshold to be subject to tax. Low-income countries are often characterized by factors that make the collection of tax infeasible, expensive and/or unproductive. These include:

(i) significant non-monetary sectors (or subsistence agricultural sectors);
(ii) a large share of the economic activity in the agricultural sector resulting in widely dispersed business activity with much of it conducted by small scale farmers with poor books and records;
(iii) large numbers of informal businesses in small scale agriculture, manufacturing, trade and services that mainly operate without books and records;
(iv) large unskilled labor force with wages levels that are largely income-tax exempt or only in falling in the lowest tax brackets;
(v) weak accounting standards and relative few professional accountants to maintain books and records for tax purposes; and
(vi) low educational attainment or relatively high illiteracy rates that make compliance with self-assessed taxes such as the income tax or VAT difficult

[10] Note that the shares of current revenue for different groupings of countries as reported in the WDI database do not necessarily add up to 100 per cent, particularly in the low income and lower middle income groups because of missing data and weighting problems in aggregating the data. As a result, adjustments have been made to the shares of revenue by source to scale them such that they add up to one hundred percent.

Table 6. Level and composition of central government revenues by country groups, 1997-8

					Shares of current revenue						
Country Group	**Year**		**Current revenue as share of GDP**	**Tax revenue as share of GDP**	**Tax revenue**	**Taxes on trade**	**Taxes on goods and services**	**Taxes on income, profits, etc**	**Social security taxes**	**Other taxes**	**Non-tax revenue**
					Percentages						
Low income	1998	As reported	13.4	11.0	82.2	20.9	27.9	16.2	0.0	1.5	13.2
Lower middle income	1998	As reported	18.5	16.0	86.6	9.7	36.6	19.5	4.0	2.6	13.6
Low income	1998	Adjusted/a	13.4	11.0	82.2	25.8	34.5	20.1	0.0	1.9	17.8
Lower middle income	1998	Adjusted/a	18.5	16.0	86.6	11.6	43.7	23.3	4.7	3.2	13.4
Upper middle income	1997	As reported	19.9	17.7	88.9	4.3	39.5	16.2	28.2	3.6	10.5
High income	1997	As reported	28.4	25.9	91.2	0.04	27.3	28.6	19.7	15.5	8.6
High income OECD	1997	As reported	28.4	26.0	91.6	0.003	26.6	29.8	25.0	10.2	7.3
European Monetary Union	1997	As reported	36.9	33.6	91.1	0.0	26.0	29.7	33.4	2.0	6.4

World Development Indicators 2004; author calculations

a. Note that the shares of current revenue for different groupings of countries as reported in the WDI database do not necessarily add up to 100 per cent, particularly in the low income and lower middle income groups because of missing data and weighting problems in aggregating the data. As a result, adjustments have been made to the shares of revenue by source to scale them such that they add up to 100%..

Even in a low-income country, however, there may be some tax handles that raise its revenue raising potential such as a relatively large volume of imports flowing through a well-managed port, or large mining operations of multinational corporations that are make significant profits and export their product in a controlled fashion. As per capita incomes grow in most economies, however, many of the adverse factors on tax administration and compliance decline and at the same time the share of workers with higher and taxable incomes grows. Growth in per capita income and income taxes on this income has proved to be the major source of revenue across countries.

While central government tax revenues from indirect consumption taxes grow from around 4% of GDP to a range of 9% to12% of GDP moving from low to high-income countries in Table 6, tax revenues from the income taxes (including social security taxes) rise rapidly across the income levels of countries: low, 3%; lower middle, 5%; upper middle, 9%, and high, 14% of GDP. Amongst the high-income countries, income and social security taxes are 16% of GDP for OECD countries, and 23% of GDP for the

European Monetary Union Countries. At all levels of government, OECD countries averaged some 26% of GDP in direct income and social security taxes in 1995.[11]

Structural features constrain the ability of low-income countries to collect taxes on income, but as income levels grow the structure of the economy changes. Importantly, the middle class becomes an increasingly large share of the economy so that in the middle-income countries, income taxes, particularly payroll-based taxes, become more feasible for more persons and the base grows rapidly as individuals both become taxable and move up into higher tax brackets. At higher per capita income levels, choice over the size and role of government becomes possible rather than the constraints on revenue collections limiting the target yield for taxes. In addition, once top tax rates have been set, tax revenues as a share of the economy are limited by these rate choices and will approach maximum yields as the efficiency of any tax rises (or the share of the economy subject to these maximum rates approaches its maximum potential.) By contrast, among low-income countries it is more typically the size and nature of the informal sector that constrains tax yields.

The informal sector forms a major constraint on tax capacity because it contains the non-monetary sector of an economy as well as those smaller producers and traders conducting unincorporated business activities with no or very incomplete business books and records. Informality at one extreme could arise from lack of literacy and numeracy, or from a lack of specific training in business management practices – generally, the sector lacks the capacity to comply with modern taxes. Typically, the scale of business activity may be such that they fall under the minimum turnover level of a sales or VAT and/or below the minimum income at which income tax would be charged. Such businesses with a lack of compliance capacity should be distinguished from small and micro-businesses, which are capable of tax compliance, but fall below the taxable limits. They should also be distinguished from the capable businesses that partially or completely fail to document their business activities and go unrecorded in direct statistical measures of economic activity or are unreported in any tax assessment. These are the underground parts of the economy – capable, but evasive. The shadow economy includes all these parts that fail to register, report or comply. It is the non-monetary and the small and incapable parts of the business sector that represent the real constraint on taxation. Often informal business activity is recognized statistically as partly rural, small-scale farmers and informal farm workers, and partly as urban informal businesses largely in trading, personal and businesses services and small-scale manufacturing, often with no permanent business premises.

The non-monetary sector in an economy is typically characterized by subsistence agriculture and self-supplied housing. In low-income economies such as Malawi, Tanzania and Kenya, these are estimated to be significant shares of GDP, and hence, raise issues of comparability of tax capacity across countries. Malawi national accounts report the self-consumed production of smallholder farmers as an estimate of the non-monetary sector valued in GDP. Between 1994 and 2003, the non-monetary sector in

[11] Vito Tanzi and Ludger Schuknecht, *Public Spending in the 20th Century: A Global Perspective*, (Cambridge: Cambridge University Press, 2000)

Malawi is reported by the National Statistical Office to have grown from 18.5% to 27.4% of GDP as the relative size of the smallholder-farming sector has grown. National accounts reported by the Central Bank of Tanzania show the non-monetary agricultural sector at 30% of GDP at factor costs in 1986, then falling to 26.1% in 1990 and rising again to 29.9% by 1999. In Kenya, the non-monetary sector over the past decade has typically been reported at close to 5.5% of GDP. Unfortunately, not all low-income countries estimate and report the share of the non-monetary sector. Ideally, a measure of the size of the non-monetary sector included in the GDP in each country would be an important variable to explain tax capacity through cross-country comparisons of its impact on tax yields.

Few countries are able to report the size of the informal labor force, whether in the rural or urban sectors. Kenya, for example, does report some estimates that are suggestive of the importance of the informal sector in the economy as a limiting factor on taxation. The *Economic Survey* reports that out of a population of 32.2 million in 2003, **only 1.8 million are employed in the modern or formal sector and a further 5.5 million are employed in the non-agricultural informal sector**. Based on *WDI(2005)* labor force estimates, then this leaves some **9.3 million working in monetary or non-monetary agricultural activities**. Compared with a decade ago, the modern sector employment has grown by only 17% **whereas the non-agricultural informal employment has grown by 85%**,[12] and the agricultural informal workers by 18%. Clearly, these data point to a shift of workers into the non-agricultural, urban informal activities. Clearly, a major problem remains for growth in direct taxes based on deductions out of wage income. Again, estimates of the size of informal employment, whether in the agricultural or other sectors are not typically available for cross-country comparisons.

Tax capacity studies as a result have typically resorted to using the share of the agricultural sector (and it is assumed that countries are providing these data inclusive of estimates of non-monetary sector activities, whether explicitly noted or not) as both an estimate of the taxing problems in that sector as well as a proxy for the relative size of the overall informal sector. As the Kenya data point out, where the non-agricultural informal sector is growing rapidly it may be underestimating the structural problem.

Estimating tax capacity

In this study, an extended version of the B&K (2005) database is used to check the importance of some of the structural variables or tax handles on the tax capacity of countries. These estimates are described and presented in Appendix E. Here the focus is on the results of the estimates. The estimates are made on the full sample of 123 countries (see Table E.1) where dummy variables are used to check whether structural features have a different impact on tax capacity amongst different income groups. For example, the implication of a larger agricultural sector in a low-income country is expected to be more constraining on tax collections than having a larger agricultural sector in a high-income country. In the former, it would likely indicate more smallholder farmers, whereas in the latter farmers may be large corporate farmers capable of

[12] There is also some evidence the per capita income of the non-agricultural informal sector has dropped in real terms limiting somewhat the growth in the share of value-added attributed to this sector.

complying with taxes. In addition, the estimates are repeated on the lower income (low- and lower middle-income) country data to check the estimates identified by dummy variables from the full database. These results appear in Table E.2.

The estimated impact of the share of GDP involved in the agricultural sector is as expected. Based on all countries, an increase of one percent of the economy involved in agriculture reduces the tax yield amongst lower income countries by about 0.2% or a coefficient of -0.2. The impact on higher income countries is more unstable, ranging from a negative impact of 0.1% to a positive impact of 0.3%. Based on the lower income countries, the same result is obtained for low-income countries of a drop of 0.2% per 1% increase in the agricultural sector share. The lower middle-income countries show a weaker response of about 0.12% drop in tax yield for a 1% increase in the agricultural sector share. These results are consistent with other studies. Glenday (2005) estimated –0.3 for the countries in the Southern African Development Community based on 1990-2001 data; Katusiime (2003) estimated a coefficient of –0. 2 for East African countries over 1991-98 and Stotsky et al (1997)[13] estimated –0.17 for Sub-Saharan African countries over 1990-95. Amongst lower income countries, the size of the agricultural sector averaged 28% over 1975-2000 with a standard deviation of 14%. With a coefficient of -0.2, an increase in 28 percentage points in the agricultural sector share implies a drop in tax yield of 5.6 percentage points – a large difference in tax capacity.

Another feature of an economy of particular interest in this study is the impact of goods imports as a share of GDP on tax capacity. Based on the data for all countries, the lower income countries show an increase of about 0.15 percentage points in tax yield per one percentage point increase in imports as a share of GDP. The effect of an increase of imports on higher income countries is in the range of -.05 to 0.06. Based on the sample of lower income countries alone, for low-income countries a tax yield increase of 0.2 is expected and for lower middle-income countries, 0.15 is expected. This is somewhat higher than estimates by Glenday (2005) for the SADC countries of 0.02 to 0.07; Stotsky et (1997) reported similarly low results for Sub-Saharan Africa and Katusiime (2003) reported 0.126 for East African countries. These studies cover more recent time periods during which trade liberalization reforms where being more actively followed, and hence, the use of import taxes was more policy constrained. In fact, if the interaction between the year and imports as share of GDP is introduced for low-income countries, it is found that the effect of imports on tax yield declined by 0.0025 per year, which would imply that the impact of imports over the 26-year period would have dropped by 0.065. Hence, the current impact of imports on tax capacity is lower, possibly nearer 0.1, because average import duty rates are now lower.

Other results of interest are a significant positive impact of the mining sector of about 0.1 per percentage points of tax yield per one percentage point increase in the mining share of GDP. This impact jumps to about 0.25 when grants and other non-tax revenues are included. These other revenues tend to substitute for taxes and may also contain non-tax

[13] Janet G. Stotsky and Asegedech WoldeMariam, "Tax Effort in Sub-Saharan Africa" IMF Working Paper (WP/97/107) September 1997

mining revenues. This result is consistent with the findings by Glenday (2005) for SADC over 1990-01 where the coefficient on mining fell in the range of 0.2 to 0.3. Mining sector share data was available for about 60% of the country-years in the sample.

Another important variable is the impact of grants and non-tax revenue on the tax yield of a country. It is well known that many oil rich and mining dominated countries are under utilizing their domestic tax bases. Hence, it is important to control for the non-tax revenues as a share of GDP in estimating tax capacity. Similarly, countries receiving significant grants from donor countries as a share of GDP are expected to partially substitute grants for tax burdens on their populations. Unfortunately, only data on the combined amount of grants and other non-tax revenue was readily available from *WDI(2005)* to extend the B&K data sample, and then only for about 20% of the sample years. When the combined effect of mining and non-tax revenues was estimated, the data was only jointly available in about 10% of the country-years. Nevertheless, the estimates on these reduced samples are consistent with expectations. For all the countries, a one percentage point increase in grants and other revenues as a share of GDP is estimated to reduce the tax yield by 0.15 to 0.5 percentage points. In the sample of lower income countries, the coefficients were in the range of -0.22 and -0.43. Glenday (2005) estimated the impact of grants on SADC tax yields in the range of -0.19 to -0.54, and the impact of non-tax revenues in the range of -0.29 to -0.55. Katusiime (2003) estimated the effect of non-tax revenue on tax yields in the study of East African countries at -0.32. These substitution effects are reconsidered below when a more complete set of the potential fiscal adjustments in response to a cut in trade tax yields are discussed in section 8.

Finally, the impact of per capita income is largely as expected. For the full sample of countries, tax yields rise with per capita GDP, but at a declining rate. In fact, the results show the tax yield peaking at about $31,000 per capita (2000 US$). This is consistent with the observation of some of the highest income countries having tax yields below the highest observed tax yields. Interestingly, **based on the estimates for the lower income countries, tax yields rise at an increasing rate after about $2,200 per capita**. This is can be explained as about the **income level at which the middle-class taxpaying population starts playing an increasingly important role in direct tax payments**. This is an important turning point for a country. It appears to indicate the income point at which the direct tax yield starts growing with the increasing importance of the middle class. Care has to be taken, however, not to extrapolate beyond the income range of these lower middle-income groups, as it is clear that the tax contribution eventually grows at a declining rate as per capita income grows in the high-income country range.[14]

Informal sector and VAT inefficiency

One immediate fallout of having a large informal sector is on the effective domestic tax base. The limitations were illustrated for the case of direct income taxes on labor income as in the case of Kenya with a very small share of employment in the formal sector. The impacts can more readily be approximated for the VAT given its simpler tax structure. The effective tax base for the VAT can be calculated if it is assumed that all the VAT

[14] Lower middle-income group has per capita GNI in 2003 US dollar of between $765 and $3,035.

revenues have been collected at the standard rate (which is typically close to being true for most broad-based VATs.) This effective base can then be compared to various national aggregates to test the "efficiency" of the VAT: comparisons are typically made with GDP, total consumption, private consumption, and total consumption reduced by the government wage bill (which is part of government consumption not subject to the VAT.) The last measure is the closest crude measure to the potential base of a consumption VAT. The actual legislated potential VAT base requires considerable detailed analysis to add back the increase in the base caused by final taxes being collected on inputs in exempt businesses, but otherwise adjusting the base downwards for various exempt sectors or zero rated parts of domestic demand. This would include the effects of small businesses with turnover levels below the minimum turnover level not having to register. The larger the informal sector in an economy, the larger is the reduction in the legislated potential VAT base. This legislated base will be smaller than the crude potential base (such as consumption in the economy reduced by the government wage bill), but will exceed the effective base by the inefficiencies arising from weak administration, poor compliance and tax evasion. For example if the potential base is 80% of GDP, but the legislated base through excluding small business (including the informal sector) and exempting various sectors reduces it to 50%, but the effective base is only 35% of GDP, then the gross inefficiency is the gap between 80% and 35% or 45% of GDP. If the maximum possible base for the legislated structure is 50% of GDP, then the gap caused by weak administration and compliance is 15% of GDP. The VAT efficiency in terms of adjusted consumption of 80% is expressed as 35%/80% = 48% and, in terms of the maximum legislated base, is 35%/50% = 70%. Here we will look at the gross VAT inefficiency and not attempt to explain the share of the gap that is closed by legislated exemptions and zero ratings, but illustrate that this gap is large and tends to be highest amongst the low-income countries with large informal sectors (which get excluded out of the typical VAT base through these firms being too small to be required to register.)

Table 7 illustrates estimates of efficiency for VAT or sales tax for a sample of individual countries, here the member states of SADC. The average for these countries in terms of GDP is 29%, consumption is 34%, consumption less government wages is 38%, and private consumption is 44%. Table 8 gives regional averages for GDP-VAT and private consumption-VAT efficiencies. The SADC estimates are slightly higher, but generally consistent with the regional averages for Sub-Saharan Africa.[15]

[15] In the case of Tanzania over 1997-2001, there is a gross tax gap of about 68% of GDP between the potential VAT base of 84% of GDP and the effective base of 16% of GDP. Here the effects of a large informal sector (including a non-monetary sector of 30% of GDP) explain about two thirds of the gross tax gap. Tax structure choices and weak administration and compliance explain the remainder.

Table 7. Average VAT/sales tax efficiency, SADC Member States, 1997-2001

Percentages

	VAT efficiency relative to			
	GDP	**C**	**C-gov wages**	**C private**
Angola	21.0	36.7		
Botswana	17.7	29.6	35.0	57.0
DRC	3.2	4.0	4.1	4.6
Lesotho	44.8	36.0	41.6	46.2
Malawi	26.7	27.1	28.8	31.6
Mauritius	38.0	49.5	54.9	59.9
Mozambique	29.3	32.4	34.9	36.6
Namibia	46.2	51.0	62.6	75.5
South Africa	41.6	50.3	53.1	65.5
Swaziland	26.4	27.6	32.3	35.7
Tanzania	16.2	16.2	16.9	17.5
Zambia	31.3	33.3	35.6	39.0
Zimbabwe	37.8	43.8	50.5	55.7
Average	29	34	38	44

Source: Glenday (2005), Table 6.6

Table 8. VAT efficiency by region

Percentage

	VAT efficiency relative to	
Region	**GDP**	**$C_{private}$**
Sub-Saharan Africa	27	38
Asia and Pacific	35	58
Americas	37	57
European Union (including Norway and Switzerland)	38	64
Central Europe, Russia, Baltic and Other States	36	62
North Africa and Middle East	37	57
Small Islands	48	83

Source: IMF Staff estimates, The Modern VAT (2001) Table 4.1

It is clear from these data that the gap between the potential tax base and the effective one is large for low-income countries, typically greater than 60% of GDP. This gap can be closed by a series of different actions or economic changes:

a. Policy and legislative changes that expand the base by removing discretionary exemptions or rate rebates, within the bounds of what is feasible in terms of administration and compliance given the structural features of the economy.

b. Structural changes in the economy through growth and development that expand the legally taxable tax base and expand the options for legal expansion of the base – such as increasing numbers of large formal businesses, higher literacy and improved business skill levels, etc.
c. More efficient administration of the existing tax laws, particularly taxpayer education and service, and removal of tax policies that induce tax evasion such as excessively high rates or penalties.

Actions under the first and last options can be taken in the short-term. Ultimately, however, the structural constraints limit what policy and administration can achieve.

An important implication or corollary of these structural features and resultant low VAT efficiencies of low-income economies is that for large segments of the population most basic needs fall outside of a VAT base – these include unprocessed food, water, shelter, primary health care and education. This leaves the VAT or sales tax falling mainly on discretionary or luxury goods. In turn, this results in the price responsiveness of the tax base being higher than would happen if a larger share of consumption were covered. Hence, the VAT is doubly constrained for low-income countries. Not only is the base effectively narrow, but it is also more price responsive than for higher income countries. This limits the ability to raise the standard tax rate much above 20%. These considerations will be expanded upon in discussing the limits of VAT to replace trade tax revenues.

6. Limits on VAT as revenue substitute for trade tax revenue

It is not surprising that the consumption VAT is commonly seen as the obvious substitute for trade tax revenue losses at least over the medium term.[16] Low-income countries rely heavily on indirect taxes on international and domestic trade for at least 50% of revenues. Aside from excise duties, a VAT or Goods and Services Tax usually represent the largest indirect tax base available in an economy. See Table 6 above.

Another argument often put forward is that import duties only tax imports, whereas a consumption VAT taxes both imports and the domestically supplied portion of total consumption. Therefore, the higher the share of consumption supplied domestically, the larger the VAT base is relative to imports. Final consumption in most economies usually exceeds imports of goods by a wide margin. This means that either more revenues can be raised at the same rate, or the same revenues can be raised at a lower rate than with import duties. At the same time, the tax distortion on the domestic supply side caused by the effective protection provided by import duties is removed. In addition, the VAT falls on the taxable non-tradables produced and consumed in the economy. This logic of VAT having the larger base holds to the extent that **import duties fall on the same final consumption base of households and government and inputs of exempt businesses**

[16] See for example, Liam Ebrill, Michael Keen, Jean Paul Bodin and Victoria Summers, *The Modern VAT*, International Monetary Fund (2001)

and non-governmental organizations as the VAT. As noted above from Table 5, however, imports in most counties are composed largely of capital equipment, raw materials and intermediate inputs. This means that most of the VAT charged on such imports would result in input VAT deductions or credits. When import duties are removed from items that would be deductible inputs under the VAT, then for the VAT to make up the trade tax losses, the VAT rates have to be increased on the effective VAT consumption base with the related market-squeezing revenue losses and efficiency costs.[17] (To some extent some of the import duty losses on inputs will be recaptured through higher income taxes on the wider profit margins of domestic businesses.)

How easy it is to make up these lost trade tax revenues when a large share of the tariff reductions are on raw materials, intermediates and capital goods depends on (a) the relative size of the domestic VAT base and (b) how high the VAT rates already are when import duty rate cuts are implemented. In section 5 above, it was illustrated that for low- and middle-income countries that the effective VAT base is typically in the range of 20% to 40% of GDP. This is about the same range in which imports as a share of GDP are found for the same economies. Appendix C shows the sample average import share for the 123 countries in the B&K (2005) database was 32.8% with a standard deviation of 27.5% of GDP. The effective sizes of the VAT and import bases are likely to be similar in many countries, but in some cases the effective import base may be larger because the structure of the economy demands high import shares and/or the inefficiency with which the VAT base is administered lowers the effective VAT base. If the VAT base is effectively only a third of GDP, then to make up a one percent of GDP loss in import duties will require at least a three percentage point increase in the standard VAT rate. How much higher will depend on the share of final VAT consumption goods in imports, the changes in the import tariff (duty rate cuts on consumption goods versus inputs), and the existing VAT rates. The higher the VAT rates already being charged, the more

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17 When import tariffs are lowered on final consumption goods in a price-taking economy, the revenues can be replaced by VAT rate increases that leave the domestic demand prices for these goods at the same or lower prices given that the VAT has a larger base of the total domestic demand for these final consumption goods and not just the share of demand satisfied through imports. This price effect, however, is also affected by the impact of tax changes on tradable goods on the exchange rate. Cutting the import tariff increases import demand for foreign exchange. This depreciates the exchange rate, somewhat offsetting the direct price decrease caused by the import tariff cut. The increased demand for foreign exchange is also dampened somewhat through the decreased import demand for traded inputs into the domestic production of the final consumption goods that decreases as its protection is reduced. Increasing the VAT rate, however, also decreases demand, including import demand that, in turn, appreciates the exchange rate offsetting most of the depreciation caused by the import tariff cut. Overall the exchange rate is left almost unchanged. This allows the VAT to replace the import duty on consumption goods without a demand price increase.

When import tariffs are lowered on intermediates, the prices of tradable final consumption goods remain unchanged as they are fixed by world prices, except if the exchange rate is affected. Lowering import tariffs on intermediates increases import demand for these goods that depreciates the exchange rate. The import demand for foreign exchange will be somewhat offset by increased down stream domestic production of goods using the cheaper intermediates and decreased demand for upstream inputs into the production of the intermediates now receiving lower protection. The domestic prices of final consumption goods in the VAT bases rise slightly as the exchange rate depreciates. The use of VAT rate increases to offset the import duty revenue loss will result in offsetting decreases in import and foreign exchange demand. This offsets the depreciation, but overall the prices of final consumption goods rise with the VAT increase bringing into play the demand responsiveness of the effective VAT base.

Exchange rate depreciation also attracts resources out of the non-tradable into the tradable sector. This will result in some increase in non-tradable prices, which also limits the room for VAT rate increases.

difficult it becomes to extract added taxes out of the base as the effective demand for taxable goods both because of market substitution and because of increased incentives to evade the tax.

As discussed in section 5, low effective VAT efficiencies tend to make the VAT more price responsive than would otherwise be expected from a broad based tax. This limits the ability to raise the VAT rate, especially if the rate is already reasonably high. Often this argument may be taken as merely speculative, but at least one country has run a real experiment that illustrates the point. Malawi has a "surtax" which was originally administered as a general sales tax and then in 1987 converted to the credit method used by the VAT. Over the period from the mid-1980s to mid-1990s, Malawi raised its surtax standard rate from 20% up to about 35% over a number of years and then lowered back to 20% over a few years. Even with is large change in the standard rate, the tax yield only varied by about 1% of GDP. This result is consistent with a high price responsiveness of the effective VAT base. The details were presented in an earlier study by Glenday (2005), but are repeated for convenience here in Appendix F. This is a very sobering illustration of the limitations of the VAT as a revenue raiser to replace trade tax losses if it is already being used heavily as a source of revenues.[18]

For many countries, VAT has already been heavily exploited. Indeed it was often introduced to replace existing broad-based sales taxes or turnover taxes that already had significant revenue yields. The VAT in these cases was introduced to gain from its potentially broader and less distortionary base (particularly in its ability to handle the service sector) and for its improved enforcement features. For many low- and middle-income economies a key feature was its taxation of all imports such that it was more difficult for the unregistered small businesses to escape involvement in the tax, at least on their inputs, if not on their outputs.

In a recent study of the implementation of VAT in the SADC region, Glenday (2005) found that of the eleven countries that had implemented VAT, only one, Mauritius could be argued to be using it to replace import duty revenues. All the other countries replaced sales or turnover taxes. Mauritius introduced a sales tax in 1983 at a rate of 5%. Through 1991, trade tax revenues remained in the range of 10.4% to 11.3% of GDP. After 1991, trade taxes dropped consistently through the 1990s to about 5.5% of GDP by 1999. At the same time total indirect taxes dropped from 14.5% to a low of 9.8% of GDP in 1996. To counter this, the sales tax rate was raised to 8% in 1996, and then a VAT was introduced in 1998 at 12% followed by a further rate increase to 15% in 2003. By 2000, total indirect taxes had recovered to 12.3% of GDP. First the sales tax, and then VAT were used to offset the revenue losses of lower trade taxes. This scenario was clearly possible because there was considerable room to raise the standard rate from 5% starting in 1996 to its current level of 15%. By contrast many low- and middle-income countries already have standard VAT rates in the range of 15% to 20%, and hence have minimal upside room for increased revenue yields through rate increases. Countries that

[18] Another example can be taken from Kenya when it raised its standard VAT rate from 15% to 18% in response to cuts in import duties, particularly on imported inputs, as discussed in section 4. The revenue yield was consistent with a high demand price elasticity of at least –1.3.

still have modest VAT or general sales tax rates – in the 5% to 10% range such as Botswana – still have some room to enhance their tax yields through rate increases. Clearly, more efficient and effective administration can increase yields in all cases. In addition, the gradual structural changes that come with economic growth also bring higher numbers of larger businesses into the indirect domestic tax net and enhance revenue yields as a share of GDP.[19]

7. Efficient trade taxes and tax alternatives

From discussion above, it should be clear that lower income countries (low and lower middle-income countries) have constraints on their ability to raise non-trade taxes (whether direct or indirect taxes) from the domestic economy to replace trade taxes as revenue source. It was also observed that in many regions countries had reverted to using trade tax regimes more as protective devices than as revenue raisers. Hence, there is considerable scope to reduce the allocative efficiency costs of trade taxes through moving back towards more uniform tariff schedules while sustaining or possibly even increasing revenues.

To consider more carefully the issue of the efficient paths that lower income countries should follow to improve the efficiency of their tax regimes, it is necessary to layout the range of efficiency costs that need to be considered. In the post World War II period, the focus in tax design fell on reducing the allocative efficiency costs. This was with good reason. The tax system had begun to be used extensively as a tool in income redistribution and sector incentives. Top marginal tax rates in the income tax often were over 50% and as high as 90%. The income tax contained a wide range of investment and other incentives. Selective high tax rates were common in sales tax and excise duty schedules targeting luxury goods. Import tariffs offered cascading tariff schedules with high top tariff rates often in excess of 100%. Hence, the price incentive effects on supply and demand-sides were enormous and concern about the allocative efficiency costs became dominant. The economic tools for measuring these economic costs also emerged through work by Harberger and others.

Tax reforms starting in the 1970s started to focus on reducing and rationalizing tax rates. An "industry" to calculate the effective marginal tax rates on investments emerged to back up these reforms. These reform efforts started in the OECD countries, particularly the UK, and gradually spread to the developing world reaching Indonesia already by the early 1980s. By the late 1990s, tax rate structures internationally, with few exceptions, had been substantially lowered and rationalized. This clearly lowered the resource allocation costs of taxes, and focus has gradually shifted and widened to recognize the importance of the other economic efficiency costs of taxes: (a) the resource costs incurred by governments through tax administration, and (b) the hidden resource costs of tax

[19] It is important to note that with *ad valorem* tax rates, it is not the growth per se that increases the tax yield, but the increase in the tax base as a share of GDP (a structural change) that increases the tax revenue as a share of GDP. If the tax base grows at the same rate as GDP, then the tax yield from an *ad valorem* tax rate remains constant.

compliance borne by the taxpayer. Unfortunately, nowhere near the same attention has been paid to the theory or empirical estimation of these economic transaction costs, particularly in the context of developing countries. In addition, more attention has focused on tax administration than compliance costs because of the difficulty of estimating these latter costs, and then only in OECD countries. See, for example, Tran-Nam et al (2000) study in Australia. By contrast, there is a growing recognition that the presence of large informal sectors in developing countries makes a difference to which taxes necessarily have the lowest efficiency costs. Studies such as Emran and Stiglitz (2005) have developed the theoretical framework to show that it is possible in countries with large informal sectors present that trade taxes can be more efficient than consumption taxes. These conclusions are achieved without consideration of the differentials in the administrative and compliance costs between tax structures that would typically strengthen their results.

What are the key concepts in tax theory that can help lead to efficient taxation of the low-income country economies with large informal sectors? Seeking ways to minimize the allocative efficiency costs of taxation has been the focus of optimal tax theory. This started with advocacy of uniform tax of goods in a first best world, but has long recognized that once not all goods are taxable, such as "leisure" or non-labor market time and products, then differential taxation can lead to efficiency improvements. Some combination of the following considerations typically form part of the policy mix improving the allocative efficiency of a tax system in a second best world:

a. Close substitutes for untaxed goods should be taxed at lower rates[20]
b. Complements to untaxed or even subsidized or protected goods should be taxed at higher rates. Complements could be inputs into production of untaxed, protected or subsidized goods.
c. Higher tax rates should be applied to inelastically demanded goods or inelastically supplied factors of production.
d. All close substitutes in production or consumption should be taxed at similar rates

It is important to recognize that only one of these rules concerns the efficiency loss in the own market of a taxed good – that is rule "c" – otherwise these rules focus on the cross-price effects between markets or the indirect effects of taxing inputs rather than outputs. Typically tax reform is implemented in a more or less incremental fashion adjusting tax structures. To the extent economic allocation costs of taxation are considered, these four considerations typically enter the analysis to remove at least the more extreme cases of efficiency costs. Hence, if these rules are applied to consideration of taxation of the informal sector, where would they direct tax designers?

[20] Lowering the tax rate on a close substitute limits the shifting of demand towards the untaxed good. Raising tax rates on compliments to an untaxed or subsidized good reduces the demand for or production of untaxed or subsidized goods. Radial compression of import tariffs, for example, includes raising the duty rates on inputs into the production of protected products to limit the domestic supply distortion.

The informal sector, as discussed above, is typically isolated from modern taxation by high administrative and compliance costs. It is most inaccessible to direct taxes such as the income tax, and next to indirect taxes such as the VAT, both which require more sophisticated record keeping. Another critical consideration would also be the nature of the outputs of the informal sector – to what extents are they close substitutes for the formal sector? The more informal outputs are substitutes in consumption for those of the formal sector, then higher tax rates in the formal sector will clearly drive more consumers and business activity into the informal sector. The more differentiated the outputs between the sectors, the weaker this effect. Local knowledge is needed as to how differentiated these markets are. The more overlap that exists in a country, however, the greater the tax problem for raising tax rates on the formal sector.

What are feasible ways or taxing the informal sector? What is the mix of efficiency considerations for each? There are three tax structures that can play roles in taxing the informal sector efficiently: (i) VAT (or general sales tax); (ii) import duties, and (iii) presumptive taxes on informal sector traders.

i. **VAT:** The VAT effectively taxes the informal sector as it is an exempt sector and inputs into the exempt businesses form a final tax base for the VAT. Hence, whether the informal sector is trading in imported or domestically produced final goods, or it is using capital or current inputs in its own production of goods or services, the VAT on inputs from imports or from the domestic formal sector will effectively tax the goods and services produced and/or purchased from the informal sector. To the extent that inputs are derived from other exempt sectors, possibly the farm sector, this effect is diluted.

   There are two major constraints on how far the VAT can be pushed in taxing the informal sector through its inputs. The one is the substitution effect mentioned above. As the VAT rate gets raised on formal sector products, it is possible that consumers switch to the informal sector and the effective VAT base gets squeezed. The other is that the a VAT rate discourages traders from registering for VAT as their turnover gets close to or above the minimum turnover limit for compulsory registration. In markets where small traders are typically less sophisticated, the VAT already presents two kinds of compliance costs. First, registration for VAT may represent a major upfront, commencement or fixed cost: the weaker the accounting capacity and tax knowledge of the trader up front, the larger the cost of registering for VAT and setting up the accounting systems and acquiring the basic knowledge of the tax system. This cost may eliminate the expected profits of business expansion. In this situation, the higher the VAT rate, then the smaller the margin on turnover expansion becomes. The second, but likely smaller compliance cost would be the recurrent costs of complying with the routine VAT filings. Hence, if a higher VAT rate squeezes the margins that can be gained from higher turnovers, then traders will become even more reluctant to absorb the compliance costs of registration and will take evasive and or avoidance actions (such business splitting). By contrast, failure to register saves the administrative costs of processing new small returns. In summary, the VAT

creates potentially significant price differentials between the formal and informal sectors that can adversely affect its yield and economic efficiency costs.

ii. Import duty: Import duties, broad based, such as a uniform tariff, and falling on the inputs into the informal sector also effectively tax the informal sector through raising its input costs. Import duties differ from a VAT, however, in two significant ways. First, uniform import duties will be more neutral across the informal-formal sector boundary as the output prices of both sectors should be increased by the same amounts if it is a uniform tariff and as long as there is no major difference in the intensity of importables in the costs of the two sectors. Second, a uniform import tariff has very low compliance and administrative costs as long as customs operations continue for other indirect taxes as well as for safety, health, environmental and security reasons. Put another way, there is little cost gain from eliminating the payment of an import duty if customs still has to enforce VAT, excise duties, etc on imports as well as other its other border control functions. It is extremely important to note that for an import duty to have a predictable impact on the informal sector it will need to be close to a uniform tariff (and certainly including the importable inputs into the informal sector), otherwise it may have no effective tax effect while still having the well known subsidy effects on domestic producers. As noted above, many current import tariffs have moved to virtually eliminate duties on raw materials and capital equipment, which removes some of the input tax effect on the informal sector from the import tariff.

iii. **Presumptive taxes on small-scale traders**. If a tax can be charged on an otherwise untaxed sector, then there are possibly efficiency gains (rather than costs) associated with this tax. This comes about because of the substitution effects with the already taxed sectors. If a turnover tax, for example, can be imposed on the informal sector, then if this causes consumers to switch back to the taxed formal sector, then there can be an expansion in taxes in the formal sector that outweighs the efficiency costs caused directly in the informal sector market by the turnover tax. The closer the outputs of the two markets are as substitutes, the bigger the gain of raising tax rates in the informal sector. This is another way of saying close substitutes should be taxed at the same rate (see rule "d" above.) This result has been recognized by some analysts. For example, Warlters and Auriol (2005) estimate that the gain from taxing the informal sector in Sub-Saharan Africa would justify an administrative and compliance cost of 13% of revenues.[21] While this seems to provide a wide margin for administrative and compliance costs, these costs may well form an even higher share of revenues. The costs of collection of small amounts of revenue across large numbers of small taxpayers can be high. By its nature, the informal sector is also not suited to the self-assessment styles of tax administration, more common under

[21] Warlters and Auriol only recognize administrative costs, omitting compliance costs, and attribute the average administrative cost to the imposition of a tax on the informal sector rather than the marginal cost of the particular tax. In the case of any tax on the informal sector administrative costs as share of revenues are likely to be higher than the average for all taxes.

the income tax or VAT, where information-rich tax returns are backed up by selective random inspections. A presumptive tax will typically need to be more "low tech," to have simple, low-cost compliance, but also be more labor intensive from the tax administration side. Tax administrators will need to be on the ground more frequently to identify the business activity of informal traders. The search for such an efficient presumptive tax system remains a key, but an under exploited tax base in low-income country tax systems. It is revisited below.

Here, it is important to point out that the size of the presumptive tax and its efficiency effects have to be considered in conjunction with the VAT so that the effective tax rate is considered as the combined effect of both the VAT on inputs into the informal sector and the presumptive tax on its outputs.[22] (The import duty impacts affect both formal and informal sectors on their outputs and inputs in a similar fashion.)

Given the different allocative, administrative and compliance costs of these three different approaches, some combination of these three taxes may form the optimal mix. The stronger the substitution effect between the formal and informal sectors, the more likely that a uniform import tariff will play a positive role, and the more likely that raising the standard VAT rate will have adverse effects. The larger the size of the informal sector and the stronger the substitution effects, the greater the efficiency gains from a presumptive tax structure that can keep its administrative and compliance costs low.

Other unusual economic structures may also lead to "non-standard" "optimal taxes." As noted above small countries, often islands have the highest trade tax yields. If customs can be efficiently operated and domestic economic activity is concentrated in a hard to tax service sector such as tourism activities, then concentrating tax collections at the border may be the most efficient tax structure.

8. Alternative fiscal adjustment channels

One of the core findings that this study is responding to is the difficulty of lower income countries to replace trade taxes with non-trade taxes in the course of implementing trade liberalization policies. This study has already noted the constraints on the broad-based income tax and VAT in lower income countries, but there are possible ways of using import duties more efficiently and seeking to gain greater revenues directly from the difficult-to-tax informal sector. Here these various options are not just summarized, but also put into the larger context of the fiscal choices countries face in financing the public sector. The choices are wider than merely the trade-off between central government trade and non-trade taxes. B&K (2005) note two such directions – one is the choice of size of

[22] For example, if α = share of inputs paying VAT at rate, v, and t = presumptive tax rate, then for the combined effect of the presumptive tax plus input VAT to be approximately equal to the output VAT, $\alpha v + t(1+\alpha v) = v$, or $t = v(1-\alpha)/(1+\alpha v)$. If v=15%, α = 70%, then t =4.1%.

government, and the other is the issue of changing revenue responsibilities between levels of government in a country – but do not expand upon these. This study will take some steps down these two roads, but not very far. It will also bring out the issues of non-tax revenues and grants, and sub-national revenues and their consequences for the tax choices. Finally, it will comment on the obvious choice of investment in more efficient tax administration as a global path to solving fiscal pressures, including tax gaps and aid dependency. Accordingly, this section will address some brief comments to the following six fiscal adjustment paths.

a. Role of import taxes
b. Taxing informal sector businesses -- potential strategies
c. Aid and non-tax revenues
d. Sub-national revenues
e. Size of government and role of the voluntary sector or non-governmental organizations
f. Tax administration improvements

a. Role of import duties

From the above analysis, it is clear that the trade tax yield has been declining for most countries internationally in recent decades (1975-2000) in line with expectations of trade liberalization efforts, but still, out of 74 lower income countries, 19 had trade tax yield increases. While upper income countries generally managed to increase total tax yields, and consequently completely replace trade tax losses, amongst the lower income countries far fewer saw rising total tax revenues. Of the 74 lower income countries, 40 had rising tax yields and of these only 26 had rising tax yields completely offsetting the trade tax losses. Given 34 countries with tax yield declines over the period, it leaves questions about whether other revenue sources were displacing central government taxes or were these countries voluntarily downsizing government?

Despite the declines in trade tax yields, trade taxes remained an important source of revenue in 2000. For the average country, the trade tax yield was 3.7% of GDP, but when weighted by GDP it dropped to 2.8% for low-income countries (LIC) and 1.2% for lower middle-income countries (LMIC). As a share of tax revenues, it was 25% for the average LIC, and 21% for the average LMIC, and when weighted by GDP, these average shares changed to 28% for LIC and 8% for LMIC. The impact of having small countries making heavier use of trade taxes is important in interpreting these results where trade taxes may yield 6% or more of GDP and more than 50% of tax revenues. Overall, trade taxes will remain important especially amongst the LIC and amongst the small, typically island economies. It has been noted that a uniform import tariff can improve efficiency through it indirectly taxing the informal sector, which tends to be most important amongst the LICs. At the margin, given that a customs administration is required to enforce any VAT, sales, turnover or excise tax, the incremental administrative and compliance costs are low.

Import tariffs on average are low internationally, but are not necessarily well structured from an economic efficiency perspective. They may need to be restructured again to achieve greater uniformity in order to be able to lay any claims to import duties making an efficient contribution to tax revenues. The proliferation of trading blocs across the world appears, at least in the case of those in southern and eastern Africa, to be setting up incentives for countries to lower tariff rates on capital goods, raw materials and intermediates not produced in the region. Moreover, these rate structures can be expected to persist in the common external tariffs (CET) that these free trade areas, customs unions or common markets will eventually have to implement. Reversing this situation will take significant coordinated policy changes and may be harder once a CET is in place given that it then becomes a multi-country decision for a trading bloc.

b. Taxing the informal business sector – potential strategies

The informal sectors, particularly the more urban-based petty traders, manufacturers and service providers, appear to be growing rapidly, if data from Kenya is representative. The informal sector is the major constraint on implementing broad-based income taxes and VAT, and yet is generally not being effectively taxed. Most countries have some sorts of taxes on small-scale business activity, typically through some form of business licensing or possibly a turnover tax. Typically, however these taxes are not well structured, not well coordinated with the larger domestic taxes (income tax and VAT), and not efficiently administered. At the same time, many central government tax administrations in lower income countries are recognizing the inefficiencies in trying to collect tax from dispersed small-scale businesses and are raising minimum turnover levels for the VAT. Some countries are simultaneously, however, trying to implement more or less well-coordinated presumptive taxes for the businesses below the VAT turnover limit for compulsory registration and/or below the minimum level for paying personal income tax. There is a growing desire to have some unified presumptive tax to capture revenues from the large number of small businesses. Many countries are searching for an appropriate structure. Glenday (2005) reviews the developments in the SADC region which include: Mozambique using a turnover tax for a layer of small business below the minimum turnover level for the regular VAT, and Tanzania using a turnover tax as part of the income tax for low turnover businesses. These structures are administered centrally. They are also limited to businesses where a turnover level can be assessed. Unit or annual fixed sum taxes are typically required to obtain broader coverage from businesses that do not issue invoices or keep books. The turnover taxes contrast with the Single Business Permit system administered by local authorities in Kenya where unit taxes per business are charged on all business activities with the rates scaled to the size of the local market and the size of different types of business as measured by some physical criteria such as number of beds in a hotel. This system utilizes the simple local registration and compliance mechanisms in conjunction with the lower labor costs and local knowledge of local authorities. Local authorities are typically involved in land use management, property taxes, market management, and other property-related services or regulation that already gives them knowledge of the business activities in their jurisdiction. If the tax covers all businesses, it also does not need to

draw a dividing line between large and small business. With unit taxes per business, the effective tax rate drops off for the larger businesses that also pay central government VAT and income taxes. Locally administered taxes also have the merit of promoting local political accountability. Local taxes can also often be placed on otherwise politically unacceptable sectors such as agricultural products given the revenues benefit the local residents. The Kenyan system, however, would benefit from central oversight and greater co-ordination with central taxpayer identification and registration. For very small countries, central administration of presumptive taxes may remain efficient, but for larger countries this is unlikely to be the case.

A significant agenda remains in studying the size and nature of the informal sector as well as designing cost-effective presumptive income taxes that utilize the strengths of local governments and central tax agencies in a coordinated fashion. The system should also incorporate ways of training businesses in accounts and the issuing of invoices and graduating them to the VAT and income tax in a smooth fashion.

c. Aid and non-tax revenues

While tax revenues on average form the bulk of central government revenues, non-tax revenues are a significant revenue source. As Table 6 shows non-tax revenues range from about 7% of the revenues of high income countries up to 18% for low-income countries. Non-tax revenues, however, are more concentrated among the oil and other mineral rich countries. How countries chose to take natural resource revenues between tax and non-tax revenues vary based on the tax and national ownership structures. Hence, not surprisingly, significant substitution is expected between non-tax and tax revenues. Unfortunately, the B&K(2005) data set does not include non-tax revenue information, and the data base also does not contain some of the resource-rich countries. A combination of grant and non-tax revenues were added for about 20% of the sample, but with more time the data could be filled out from the financial records of most countries. It is of interest to verify how countries have varied the use of non-tax revenues over time and whether they have been used as a substitute for trade taxes.

Grants from foreign donors form another important source of revenues for low-income countries. Grants to LICs are often in the 1% to 3% of GDP range. These amounts are similar in magnitude to the trade taxes. Grants are of interest here for a number of reasons. First, grants often substitute for revenue effort as the tax capacity estimates above show. An added dollar of grants substitutes for 0.2 to about 0.5 of a dollar of taxes. This means that some of the tax capacity of countries is suppressed, but fortunately that means that the tax effort of countries can be increased to replace grants, which can be expected to decline over time as countries develop or aid gets withdrawn for other reasons. Second, it is important to note the magnitude of grants is similar to that of trade taxes – the potential future loss of grant revenue faces countries with a revenue challenge of similar magnitude to a loss of trade taxes through trade liberalization. Third, trade liberalization has often been a policy condition for the receipt of program aid, sometimes substituting for forgone trade tax revenues at least in the short term. Further

study of the role of aid in trade liberalization and financing government operations is advisable.

d. Sub-national revenues

Revenues are collected by national and sub-national governments in a country depending on how revenue sources are assigned across levels of government. There is incomplete data available internationally and considerable variations in cross-country experience, but some trends have been observed. Based on GFS data for 1980-98, sub-national revenues trended upwards from 17% to 25% of total revenues.[23] High-income countries tend to have higher shares of revenue at the sub-national level at about 20% than low-income countries at about 9% in 1998. Large countries also tend to have higher shares collected at the sub national level. For example, India had about 34% collected at the sub-national level 1998, and sub-national levels in China collected about 59% of revenues in 2001 (including shares of the VAT and income tax revenues). Among the high-income OECD countries there is enormous variation in the revenue collections from a low of 4% of total revenues in Greece up to 40% in Canada in 1998. Clearly, with the variation across countries in the degree of decentralization and apparent growing trend towards decentralization, the interpretation of central government revenues could be significantly affected by these variations. This also impacts dramatically the discussion of the total tax or revenue yield in the large countries which otherwise appear to be operating much smaller governments if only central revenues are considered than they are if revenues from all levels are included.

e. Size of government and role of voluntary sector

As B&K (2005) point out, governments may choose or be constrained to smaller sizes as a share of GDP as trade tax yields fall. As discussed above, 34 out of 74 lower income countries had declining tax revenues over 1975-2000. As Table 1 shows that while high-income OECD countries had increases in the tax yields, low-income countries (LIC) on average had decreases in tax yields. While the average tax yield is fairly low for LIC at 13% appearing to leave limited room for revenue cuts to be absorbed through downsizing government, there is considerable variation in yields with some LIC with tax yields over 20%. Interestingly, as the tax capacity estimates also show that countries in Sub-Saharan Africa tend to higher tax yields than the average of the other countries in the same income groups by about 6 to 7 percentage points, while those in Asia and the Pacific are only one to two percentage points above. This opens the question about whether some of the high tax yield countries should preferably adjust to trade liberalization through down sizing government rather than by imposing added non-trade taxes.

[23] Estimates of the share of sub-national revenues in total revenues are based on IMF GFS country data, 1998, by Robert Ebrel, Workshop on Intergovernmental Fiscal Relations in East Asia World Bank Institute, Indonesia, 2002

As an aside comment, different countries promote varying roles for non-government organizations in delivering public services. This is, in part, a national choice on the organization of the public service delivery in a country and, in part, a result of private and official donor choices on how to channel funds to a country. These choices are more difficult to measure, but no doubt also impact choices about the size of government.

f. Tax administration improvements

As discussed for the VAT above, taxes under perform in lower income countries falling short of the potential tax bases by some 60%. Most of this short-fall can be attributed to structural features such as large informal sectors that will require long-term development efforts to overcome, but at the same time there remains a considerable gap between the legislated potential taxes bases, which typically exclude the hard-to-tax sectors, and the effective base that can be closed through more active tax administration efforts and upgrades. These include more effective identification and registration of taxpayers, better taxpayer education and services, making filing and payment of taxes less burdensome, efficient audit selection, competent and effective audits, control of corruption, reasonable and enforced penalties, training prosecutors and taxpayers, and using specialized tax courts to resolve tax disputes, efficient debt collection of tax arrears, expanded use of computerization and e-governance techniques, efficient functional organization, costing of tax administration functions and collection costs, and on-going and expanded training efforts, amongst others. Many tax agencies are aiming at best practices in many of these areas, but few have achieved best practice in most areas. There remains massive scope for technical assistance, institutional development and training to support improved tax administration.

9. Recommendations

Arising out of this study are some clear policy and research agendas both to improve the interrelationship between trade liberalization and tax revenues and to enhance the understanding of how to achieve more cost-effective tax administration and compliance:

Encourage moves towards more uniform import duty rate structures through a return to radial compression of tariff rates. This will require a review of the strategies that are being followed by various groups of countries to form free trade areas, customs unions or common markets (or all three in sequence) to encourage a more rapid movement towards establishing the institutional mechanisms to formulate and sustain CETs. In addition, member states of these trading blocs should be encouraged to mutually agree to remove all export platform treatments of exports within a trading bloc. This second policy is critical to achieving agreement on a more efficient and uniform CET. There is also need to gather the information on the current tariff schedules that are evolving in the new trading blocs to confirm the direction that they are in fact taking and assess potential adverse impacts on revenues and allocative efficiency.

Introduce or enhance informal sector taxation: Efforts are needed to assess the size, nature and growth of informal sectors and devise efficient strategies for the imposition of presumptive income taxes, including the potential role of local authorities in administering these taxes and the co-ordination of the administration of such taxes with central agencies. While the importance of the role of the informal sector is gaining growing recognition in tax policy, information on the sector is poor. A focus on the employment numbers and earnings in the agricultural and non-agricultural sector components is required through labor force and/or household income and expenditure surveys.

Need for focus on theory and estimation of administration and compliance costs: Tax compliance and administration costs are re-emerging as having significant efficiency considerations, but there is weak information, especially for lower income countries on estimates of average and marginal tax compliance and administration costs. Estimates are required of the fixed entry costs of different taxpayers registering and developing the compliance capacity for different tax types as well as the recurrent costs of compliance. The interactions between administration costs and compliance costs needs to be understood – by how much do tax education and services lower compliance costs? Elements of this work should overlap with the study of the design of taxes for informal sectors.

Multiple fiscal adjustment channels: Broader understanding is required of the fiscal adjustment channels different countries are using to accommodate trade liberalization revenue losses. The analysis needs to recognize the roles of non-tax revenues, grants and sub-national revenues, in particular.

Tax data improvements: There is need to build on the excellent data set constructed by B&K (2005). Clearly considerable careful work is required to construct reasonably accurate and consistent data. Appendix A notes more specific issues, especially in improving VAT data. Useful additions would be to fill out the full picture of sources of revenue: add non-tax revenue (particularly, noting where it is derived from natural resources), grants received by governments, separating export taxes from other trade taxes (especially noting where they are derived from mineral exploitation), and where feasible, sub-national revenues, both tax and non-tax. The issue of sub-national revenue is particularly important for the large countries such as China and India with large provincial and state governments. In addition, expansion of the database to cover Russia and the transitional countries, even if for more limited time periods, is needed to improve the coverage of the database.

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Appendix A

Characteristics of trade tax sample

The data used in the study is based on the data sample used by B&K (2005). The 125 countries included in the sample are given in Table A.2 grouped by income class and region. Five income classes are recognized according World Bank Development Indicators classifications: low, lower middle, upper middle and high income,[24] with high income countries divided between OECD and non-OECD countries. The high-income OECD countries are also referred to industrial countries. The regions recognized are Sub-Saharan Africa, North Africa and the Middle East, Asia and the Pacific, Western Hemisphere, and Europe.

In this study 123 countries are included. Brunei and Myanmar are dropped because some basic economic indicators are not readily available. Table A.1 shows the break down of the sample population by income class and compares it with the full sample of all countries in terms of the number of countries included, the share of GDP (measured in US dollars in 2000) and the share of the populations in 2000.

Table A. 1 Representation of sample countries of all countries by number, population and GDP in US$ in 2000

Panel A	**Sample Countries**					
Income class of country	**Number**	**% of all countries**	**Population, 2000**	**% of all countries**	**GDP, US$, 2000**	**% of all countries**
Low income	39(40)	64%	1,819,273,000	84%	740,288,230,826	89%
Lower middle income	35	63%	2,020,935,200	78%	2,145,466,878,000	64%
Upper middle income	21	57%	124,037,990	39%	775,456,980,000	43%
High income non-OECD	4(5)	13%	7,183,000	22%	141,350,700,000	24%
High income OECD	24	100%	898,996,100	100%	24,520,588,700,000	100%
Total	**123**	**59%**	**4,870,425,290**	**81%**	**28,323,151,488,826**	**91%**

Panel B	**All Countries**					
Income class of country	**Number**	**Relative share (%)**	**Population, 2000**	**Relative share (%)**	**GDP, US$, 2000**	**Relative share (%)**
Low income	61	29%	2,161,090,860	36%	835,540,993,315	3%
Lower middle income	56	27%	2,588,696,810	43%	3,358,498,206,000	11%
Upper middle income	37	18%	321,818,850	5%	1,787,063,840,000	6%
High income non-OECD	30	14%	32,884,890	1%	598,324,090,000	2%
High income OECD	24	12%	898,996,100	15%	24,520,588,700,000	79%
Total	**208**	**100%**	**6,003,487,510**	**100%**	**31,100,015,829,315**	**100%**

[24] The classification of countries follows the World Bank classification based on per capita GNI in 2003 US dollars: low income countries , $765 or less; lower middle income, between $765 and $3,035; upper middle income, between $3,036 and $9,385; and high income, $9,386 and above

The sample of countries includes 59% of all countries, 81% of the world population, and 91% of the world GDP. The sample includes the two most populous countries, China and India, and all the high-income OECD or industrial countries, which account for 79% of GDP measured in US dollars in 2000 even though they only contain 15% of the world population. The main grouping of countries excluded from the sample is the transitional or former socialist countries of Eastern Europe and Central Asia as well as Russia. This results in lower representation in the upper middle-income group. For these transitional economies there are problems both with getting data for 1975-2000, and because of the major shifts in economic policy that have occurred starting in the 1990s. In addition, there is low representation in the high-income non-OECD group, but this is largely formed of many small economies, which only constitute about 1% of the world population and about 2% of the world GDP. Overall, the sample of countries can be taken as sufficiently representative to draw conclusions about major trends in trade and overall taxation across countries.

Data adjustments and issues

As B&K note in their study, this data draws heavily upon the country reports on the economic performance of countries including the reports on the financial operations of the government as this data is available for a wider selection of countries and years than the tax collection data provided in the Government Finance Statistics. Even so there are still often difficulties in interpreting country tax and other revenue data to be sure of the correct classification. This often requires detailed local knowledge of the tax structures of countries to be aware of some of these issues.

One adjustment that was made to the trade tax revenue for this study was to adjust the trade taxes collected by the five member states of the Southern African Customs Union (SACU): Botswana, Lesotho, Namibia, South Africa and Swaziland. Under SACU tax collection arrangements all customs and excise duties are pooled and shared across the member states. These SACU revenues are typically reported as trade taxes, but about half of these revenues are excise duties on domestic consumption. According the detailed reports from SACU administration from South African National Treasury on the annual composition of collections into the SACU pool were used to divide these revenues into trade and non-trade taxes.

Other problems are known, but no adjustments were applied. One example is the export tax charged by Ghana on cocoa. In this case, the export tax serves double duty. It is part income tax and part export duty. Cocoa farmers are exempt from income tax and the export tax acts as a presumptive income tax, but it is all reported as a trade tax. In 2000, for example, cocoa taxes equaled about 26% of the regular import duties collected. It is not know what share of this is attributable to the tax that would have been collected on cocoa farming income and what residual is effectively an export duty. Similar problems of tax classification arise with mining tax and non-tax revenues for oil and other minerals depending how the government takes its share of the resource rents between income taxes, royalties, selective sales taxes, export duties and dividends where it owns a share

of the mines. Future studies may want to separate out "regular" import duties from other trade taxes.

Another common problem of attribution also occurs in the cases of bonded manufacturing where import duties are charged on the sales into the domestic market. This type of problem is particularly acute in the cases where bonded oil refineries exist and all taxes and duties are charged on the ex-refinery sales into the domestic market rather than on the crude inputs into the refinery. Such an example exists in Kenya. In these cases, where both excise and import duties are charged on the refined product sales, the split is somewhat arbitrary and import duties can well be treated as excise duties on domestic consumption. Given refined oil products are typically subject to high duty rates, this division of taxes can have a significant impact on estimates of trade taxes.

The B&K study, as does this study, find it useful to make inter-country comparisons in terms of tax yields measured as a share of GDP. GDP figures are taken from the World Bank Development Indicators database. As discussed in Glenday (2005), ideally the GDP estimates should be for the same period as the revenue estimates. This is not always the case as typically GDP figures are measured on a calendar year basis whereas revenue data is collected on a financial or fiscal year basis with only some countries using the calendar year as their financial year. Many have financial years that end on the last day of the first, second or third quarters. In WDI data fiscal year data, which is used in the B&K study, fiscal years ending on or before June 30 are reported in the year of the start of the fiscal year, while fiscal year data with a fiscal year ending after June 30 are reported in the year in which the fiscal year ends. Given for possible differences between fiscal years of tax revenues and national accounts data, care has to be taken to adjust them to the same time period to avoid the tax yield relative to GDP being systematically over or under estimated. This can clearly cause problems when making inter country comparisons. It is not clear exactly how the ratios of taxes to GDP were calculated in the IMF database. This is an area that deserves some careful scrutiny to help ensure the cleanest possible database for policy analysis.

Another concern is the VAT collection data errors that appear in a few major databases. A common difficulty is reporting the VAT collections made by customs services on imports as the part of trade taxes rather than part of the VAT. In such cases only the net domestic VAT collections are reported as VAT collections. Such domestic collections are net of the VAT on imported inputs that are deducted from the domestic output VAT. As a result, total VAT collections that are actually in the 4% to 6% of GDP range are reported as only about 2% of GDP. This problem is found in the IMF Government Financial Statistics (GFS) data as well as the Michigan University *World Tax Database*. For example, the Ghana Ministry of Finance reports VAT collections of Cedi 1,964 billion or 5.2% of GDP in 2001, whereas the GFS database reports VAT of only Cedi 509 billion or 1.3% of GDP, while the balance of Cedi 1,455 billion or 3.8% of GDP is reported as an "exchange tax" under taxes on international trade. This last amount is actually the import VAT collection in 2001.

Table A.2 Countries included in the trade tax sample

Income Class	Region				
	Sub-Saharan Africa	**North Africa & Middle East**	**Asia & Pacific**	**Western Hemisphere**	**Europe**
Low income	Benin Burkina Faso Burundi Cameroon Central Afr.Rep. Chad Comoros Congo, Rep. of Côte d'Ivoire Ethiopia Gambia Ghana Guinea Kenya Lesotho Madagascar Malawi Mali Mozambique Niger Nigeria Rwanda Sâo Tomé & Principe Senegal Sierra Leone Tanzania Togo Uganda Zambia Zimbabwe	Mauritania Pakistan	Bangladesh Bhutan India Myanmar /a Nepal Papua New Guinea Solomon Islands	Haiti	
Lower middle income	Equatorial Guinea Namibia South Africa Swaziland	Algeria Djibouti Egypt Iran Jordan Morocco Syria Tunisia	China Fiji Indonesia Kiribati Maldives Philippines Sri Lanka Thailand Tonga Vanuatu	Bolivia Colombia Dominican Republic Ecuador El Salvador Guatemala Guyana Honduras Jamaica Paraguay Peru Suriname	
Upper middle income	Botswana Gabon Mauritius Seychelles	Oman	Malaysia	Antigua and Barbuda Argentina Barbados Belize Chile Costa Rica Dominica Grenada Panama St. Kitts and Nevis St. Lucia St. Vincent & Grenadines Trinidad and Tobago Uruguay Venezuela	
High income, non-OECD		Bahrain Kuwait	Brunei /a Singapore	Bahamas	
High income, OECD			Korea Australia Japan New Zealand	Canada United States	Austria Belgium Denmark Finland France Germany Greece Iceland Ireland Italy Luxembourg Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom

a. Brunei and Myanmar were not used in the study as some basic economic structural variables were not available for these countries

Appendix B

Annual average tax and trade tax yields, 1975-2000

This appendix reports the average tax yield (total tax revenue as a share of GDP) for the countries in the Baunsgaard & Keen (2005) data set for each year 1975-2000 broken out by income groups in Table B.1. The income groups recognized are low, lower middle, upper middle, high non-OECD and high OECD countries. The averages are calculated both as the simple of average of the countries in the income group and the average weighted by the GDP of each country measured in constant 2000 US$. The number of countries in each year and income group is also reported.

Table B.2 reports the average trade tax yields in a similar fashion to the tax yields.

Tables B.3 reports the share of trade taxes in the total taxes based in the results in Tables B.1 and B.2.

Table B.1 Average tax revenue over GDP for countries in various income classes by year for 1975-2000

	Average country tax revenue over GDP						GDP weighted average tax revenue over GDP						Number of countries in sample					
	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL
1975	13.55	18.55	22.95	16.39	32.02	23.22	10.34	16.13	24.77	16.88	28.23	27.60	12	17	7	2	24	62
1976	14.00	17.02	22.45	16.20	32.88	22.73	10.67	15.35	22.60	16.34	28.45	27.72	15	17	8	2	24	66
1977	15.72	17.22	24.08	11.74	33.38	23.24	10.58	16.44	22.14	9.23	29.07	28.26	16	16	9	3	24	68
1978	16.33	16.92	21.84	12.62	33.35	22.26	11.12	16.61	19.67	10.89	29.07	28.09	21	20	14	3	24	82
1979	15.90	17.73	22.95	11.19	33.31	21.74	12.40	15.30	20.90	7.56	29.21	28.00	28	26	18	3	24	99
1980	15.91	16.68	22.98	10.37	34.40	21.48	12.74	14.55	16.32	9.11	30.09	28.61	31	26	21	4	24	106
1981	15.75	16.39	23.57	10.58	35.18	21.41	12.48	15.10	17.98	10.90	30.56	29.07	33	29	21	4	24	111
1982	15.40	16.28	22.98	11.02	35.63	21.13	12.15	14.79	15.57	12.11	31.03	29.39	35	30	21	4	24	114
1983	15.20	16.31	22.84	11.96	35.89	21.09	11.84	15.04	15.45	12.09	30.47	28.87	36	30	21	4	24	115
1984	15.44	16.83	23.09	11.82	36.16	21.40	11.84	15.24	15.43	11.72	30.51	28.91	36	30	21	4	24	115
1985	15.03	17.65	23.91	10.82	36.16	21.50	12.18	18.67	18.71	10.37	30.80	29.43	36	33	21	4	24	118
1986	15.49	17.39	22.65	10.32	36.68	21.33	12.86	17.50	16.82	8.77	31.10	29.59	38	33	21	4	24	120
1987	14.07	17.30	20.77	9.73	36.88	20.52	11.92	15.93	12.67	9.01	31.74	29.94	38	34	21	4	24	121
1988	14.11	17.30	20.77	9.73	36.88	20.48	11.86	16.03	12.86	9.63	31.71	29.91	39	34	21	4	24	122
1989	14.13	17.47	20.14	10.00	36.61	20.38	11.66	16.65	12.86	10.03	31.86	30.09	39	34	21	4	24	122
1990	14.58	17.88	20.76	12.55	36.59	20.89	12.11	16.27	14.47	14.67	31.81	30.08	39	34	21	3	24	121
1991	13.73	17.62	21.44	12.93	36.56	20.67	11.68	15.69	15.04	15.25	31.70	29.90	39	34	21	3	24	121
1992	13.68	18.20	20.95	10.43	36.73	20.62	11.13	14.89	14.55	11.65	31.33	29.39	39	34	21	4	24	122
1993	13.09	17.91	21.61	10.76	36.78	20.48	9.75	14.61	15.58	11.37	31.36	29.29	39	34	21	4	24	122
1994	13.19	18.30	21.08	11.22	36.99	20.59	10.15	13.94	15.71	11.84	31.27	29.12	39	34	21	4	24	122
1995	13.63	18.20	21.07	11.15	36.78	20.64	10.45	13.68	15.12	11.37	31.59	29.32	39	35	21	4	24	123
1996	13.33	18.14	20.75	10.54	37.23	20.54	10.52	13.40	14.90	11.67	31.74	29.35	39	35	21	4	24	123
1997	13.51	18.26	21.43	10.16	37.50	20.78	10.37	14.00	15.62	11.50	31.98	29.57	39	35	21	4	24	123
1998	13.73	18.56	20.75	10.31	37.70	20.87	9.84	13.92	14.38	10.60	32.11	29.62	39	35	21	4	24	123
1999	13.77	18.41	20.85	11.02	38.15	20.83	10.13	14.67	14.28	11.66	32.13	29.69	39	35	21	4	23	122
2000	14.19	18.39	20.97	10.62	38.85	20.74	10.62	14.65	14.48	11.63	32.74	30.16	38	33	20	4	20	115

LIC = Low income country; LMIC = Lower middle income country; UMIC = Upper middle income country; HI Non-OECD = High income, non-OECD country; HI OECD = High income OECD country

Table B.2 Average trade tax revenue over GDP for countries in various income classes by year for 1975-2000

	Average country trade tax revenue over GDP						GDP weighted average trade tax revenue over GDP						Number of countries in sample					
	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL
1975	4.40	5.56	4.39	5.83	1.06	3.43	2.37	3.02	2.61	2.65	0.45	0.57	12	16	7	2	24	61
1976	4.50	4.45	3.83	6.36	1.06	3.17	2.56	2.68	2.65	2.81	0.47	0.60	14	16	8	2	24	64
1977	5.44	4.10	4.54	4.04	1.05	3.39	2.73	3.05	2.86	1.67	0.44	0.59	16	15	9	3	24	67
1978	5.98	4.81	4.91	4.11	0.98	3.99	3.21	3.35	2.90	1.71	0.44	0.61	22	20	13	3	24	82
1979	5.77	5.03	5.57	4.12	0.95	4.29	3.52	2.52	2.86	1.53	0.44	0.63	28	26	16	3	24	97
1980	5.53	4.83	5.87	4.02	0.89	4.29	3.65	2.34	3.08	1.76	0.41	0.60	31	26	19	4	24	104
1981	5.58	5.13	5.56	3.74	0.89	4.38	3.76	2.55	2.24	1.76	0.39	0.62	33	29	21	4	24	111
1982	5.24	4.84	5.38	4.03	0.85	4.19	3.62	2.27	2.02	2.04	0.39	0.60	35	30	21	4	24	114
1983	5.04	4.79	5.42	4.69	0.83	4.15	3.42	2.20	2.10	2.10	0.38	0.58	36	30	21	4	24	115
1984	5.19	5.09	5.15	4.59	0.84	4.23	3.59	2.21	1.96	1.98	0.39	0.60	36	30	21	4	24	115
1985	5.38	5.09	5.09	4.35	0.77	4.28	3.89	2.43	2.48	1.81	0.37	0.61	36	33	21	4	24	118
1986	5.56	4.77	5.55	4.12	0.72	4.32	4.09	2.09	2.22	1.72	0.36	0.58	38	33	21	4	24	120
1987	4.85	4.76	5.55	3.99	0.74	4.10	4.09	1.99	2.08	1.59	0.38	0.60	38	34	21	4	24	121
1988	4.50	4.68	5.86	3.78	0.67	3.99	3.75	1.88	1.91	1.51	0.38	0.57	39	34	20	4	24	121
1989	4.47	4.63	5.59	3.53	0.64	3.91	3.74	2.07	2.43	1.33	0.35	0.57	39	34	20	4	24	121
1990	4.31	4.91	5.44	4.17	0.59	3.91	3.73	1.94	1.89	1.40	0.33	0.53	39	33	20	3	24	119
1991	4.15	4.55	5.19	4.11	0.56	3.71	3.45	1.85	1.71	1.37	0.31	0.51	39	33	20	3	24	119
1992	4.19	4.61	5.03	4.33	0.51	3.71	3.27	1.79	1.74	1.35	0.30	0.50	39	33	20	3	24	119
1993	4.02	4.39	4.97	3.31	0.42	3.54	2.89	1.72	1.59	1.09	0.28	0.47	39	33	20	4	24	120
1994	4.05	4.27	4.57	3.52	0.38	3.45	2.98	1.57	1.50	1.04	0.29	0.47	39	33	20	4	24	120
1995	3.96	4.25	4.28	3.44	0.36	3.36	3.16	1.47	1.40	0.94	0.27	0.46	39	34	20	4	24	121
1996	3.78	4.17	3.73	3.02	0.33	3.17	3.23	1.37	1.36	0.87	0.26	0.44	39	34	20	4	24	121
1997	3.61	3.96	3.56	3.15	0.32	3.03	2.91	1.24	1.53	0.89	0.24	0.42	39	34	20	4	24	121
1998	3.47	3.81	3.63	3.19	0.19	3.02	2.65	1.18	1.35	0.97	0.17	0.34	39	34	19	4	20	116
1999	3.24	3.62	3.40	3.16	0.12	2.86	2.63	1.22	1.21	0.95	0.14	0.32	39	34	19	4	19	115
2000	3.12	3.68	3.07	2.88	0.05	2.92	2.43	1.24	1.06	0.83	0.13	0.31	38	32	18	4	12	104

LIC = Low income country; LMIC = Lower middle income country; UMIC = Upper middle income country; HI Non-OECD = High income, non-OECD country; HI OECD = High income OECD country

Table B.3 Trade tax revenue as share of total tax revenue for countries in various income classes by year for 1975-2000

	Trade taxes as share of taxes for average country						Trade taxes as share of taxes for GDP-weighted average country					
	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL	LIC	LMIC	UMIC	HI Non-OECD	HI OECD	ALL
1975	32%	30%	19%	36%	3.3%	15%	23%	19%	11%	16%	1.6%	2.1%
1976	32%	26%	17%	39%	3.2%	14%	24%	17%	12%	17%	1.7%	2.2%
1977	35%	24%	19%	34%	3.1%	15%	26%	19%	13%	18%	1.5%	2.1%
1978	37%	28%	23%	33%	2.9%	18%	29%	20%	15%	16%	1.5%	2.2%
1979	36%	28%	24%	37%	2.9%	20%	28%	16%	14%	20%	1.5%	2.2%
1980	35%	29%	26%	39%	2.6%	20%	29%	16%	19%	19%	1.4%	2.1%
1981	35%	31%	24%	35%	2.5%	20%	30%	17%	12%	16%	1.3%	2.1%
1982	34%	30%	23%	37%	2.4%	20%	30%	15%	13%	17%	1.2%	2.0%
1983	33%	29%	24%	39%	2.3%	20%	29%	15%	14%	17%	1.2%	2.0%
1984	34%	30%	22%	39%	2.3%	20%	30%	15%	13%	17%	1.3%	2.1%
1985	36%	29%	21%	40%	2.1%	20%	32%	13%	13%	17%	1.2%	2.1%
1986	36%	27%	24%	40%	2.0%	20%	32%	12%	13%	20%	1.2%	2.0%
1987	34%	28%	27%	41%	2.0%	20%	34%	13%	16%	18%	1.2%	2.0%
1988	32%	27%	28%	39%	1.8%	19%	32%	12%	15%	16%	1.2%	1.9%
1989	32%	27%	28%	35%	1.7%	19%	32%	12%	19%	13%	1.1%	1.9%
1990	30%	27%	26%	33%	1.6%	19%	31%	12%	13%	10%	1.0%	1.8%
1991	30%	26%	24%	32%	1.5%	18%	30%	12%	11%	9%	1.0%	1.7%
1992	31%	25%	24%	42%	1.4%	18%	29%	12%	12%	12%	1.0%	1.7%
1993	31%	25%	23%	31%	1.1%	17%	30%	12%	10%	10%	0.9%	1.6%
1994	31%	23%	22%	31%	1.0%	17%	29%	11%	10%	9%	0.9%	1.6%
1995	29%	23%	20%	31%	1.0%	16%	30%	11%	9%	8%	0.9%	1.6%
1996	28%	23%	18%	29%	0.9%	15%	31%	10%	9%	7%	0.8%	1.5%
1997	27%	22%	17%	31%	0.9%	15%	28%	9%	10%	8%	0.8%	1.4%
1998	25%	21%	17%	31%	0.5%	14%	27%	8%	9%	9%	0.5%	1.2%
1999	23%	20%	16%	29%	0.3%	14%	26%	8%	8%	8%	0.4%	1.1%
2000	22%	20%	15%	27%	0.1%	14%	23%	8%	7%	7%	0.4%	1.0%

Appendix C

Effect of country size on imports and trade taxes as a share of GDP

1. Estimate of import share

Dependent variable:

Import value of goods as share of GDP (%) (*WDI 2005*))

Explanatory variables:

Population (*WDI 2005*)
GDP in constant 2000 US$ (*WDI 2005*)
GDP per capita in constant 2000 US$
Income group dummy variables
LIC =1 for low income country
LMIC = 1 for lower middle income variable
UMIC = 1 for upper middle income country
Indust =1 for high-income OECD county
High-income non-OECD country is excluded group

Dependent variable: Imports of goods as a share of GDP

Sample: 123 countries, 1975-2000

Variable	**Coefficient**	***t-Statistic***	**Coefficient**	***t-Statistic***
Constant	86.217	*39.0*	33.331	*43.6*
Population	-1.40E-07	*-9.0*	-1.56E-07	*-9.3*
Population squared	1.15E-16	*7.9*	1.33E-16	*8.4*
GDP	-6.90E-12	*-3.4*	-1.41E-11	*-6.3*
GDP squared	1.01E-24	*3.8*	1.96E-24	*6.7*
GDP per capita			1.45E-03	*7.5*
GDP per capita squared			-4.45E-08	*-6.4*
LIC	-56.364	*-23.8*		
LMIC	-50.491	*-21.2*		
UMIC	-44.524	*-18.2*		
Indust	-54.495	*-21.7*		
Sample size	2,786		2,777	
Adjusted R-squared	24.3%		9.6%	
F-statistic	112.63		49.94	
Mean dependent variable	32.85			
Std. Dev dependent variable	27.52			

Estimates show imports of goods as share of GDP declining with larger country size as measured by population and real GDP, but rate of decline decreases with as country size grows.

2. Estimate of trade tax yield

Dependent variable:

Trade tax revenue as share of GDP (*B&K, IMF 2005*)

Explanatory variables:

Import value of goods as share of GDP (%) (*WDI 2005*))
Year = Calendar year, 1975 through 2000
Other variables as above

Dependent Variable: Trade tax revenue as a share of GDP

Sample: 123 countries, 1975-2000

Variable	**Coefficient**	*t-Statistic*	**Coefficient**	*t-Statistic*
Constant	-270.510	*-3.58*	-250.222	*-3.28*
Population			-9.15E-09	*-5.78*
Population squared			6.79E-18	*4.42*
GDP	-4.27E-13	*-1.90*		
GDP squared	6.87E-26	*2.18*		
Imports of goods as share of GDP	0.047	*20.25*	0.045	*18.97*
Year	0.136	*3.58*	0.126	*3.28*
LIC	493.185	*6.06*	477.776	*5.82*
LIC*Year	-0.246	*-6.01*	-0.238	*-5.77*
LMIC	447.596	*5.44*	417.146	*5.03*
LMIC*Year	-0.223	*-5.40*	-0.208	*-4.99*
UMIC	435.397	*5.14*	416.994	*4.89*
UMIC*Year	-0.217	*-5.11*	-0.208	*-4.85*
Indust	363.751	*4.41*	333.756	*4.01*
Indust*Year	-0.183	*-4.41*	-0.168	*-4.01*
Sample size	2,670		2,693	
Adjusted R-squared	33.7%		35.0%	
F-statistic	113.85		121.64	
Mean dependent variable	3.64			
Std Dev dependent variable	3.50			

Estimates show trade tax share increasing with the import share (which declines with population size) and decreasing with country size as measured by either population or real GDP, but rate of decline decreases with an increase in country size.

Appendix D

Average trade and total tax adjustments over 1975-2000 for each country

Based on the trends estimated in the trade tax and (total) tax yields of each the 123 countries in the Baunsgaard & Keen (2005) data set over the sample period of 1975-2000, estimates of the changes in the trade tax and total tax over the period are made as well as mid-point estimates (which are estimates of the average trade tax and tax yields of each country over this period.) For each country its tax adjustment experience is put into one of the following three adjustment patterns:

4. **Trade tax yield reduction with either complete or partial replacement by non-trade taxes.** Complete replacement is observed when the change in trade tax yield is negative, but change in total tax yield is positive. Partial replacement is observed when the reduction in total tax yield is less than the reduction in the trade tax yield.
5. **Both trade tax yields AND non-trade tax yields declined.** These cases are observed when the trade tax yield was reduced, but the reduction in total tax yield was even higher.
6. **Trade tax yields increased, and either an increase in total tax revenues or a decrease in total tax revenues.** Where yields in total taxes rose, the trade taxes either completely offset a non-trade tax decline or contributed to increase in all tax revenues. Where total tax yields declined, the trade tax yield increases offset some of the decline.

The results are for the 123 countries are broken out into five tables (Tables D.1 –D.5) each covering the countries in an income group and with the table the results are broken out by region (Sub-Saharan Africa, North Africa & Middle East, Asia & Pacific, Western Hemisphere, and Europe) and by the three adjustment patterns in taxes. The income groups contain the following numbers of countries:

Table D.1: 39 low-income countries
Table D.2: 35 lower middle-income countries
Table D.3: 21 upper middle-income countries
Table D.4: 4 high-income non-OECD countries
Table D.5: 24 high-income OECD countries

The 23 countries, which had an average trade tax yield above 6%, are highlighted.

Table D.1. Trend or average adjustments in total taxes and trade taxes as share of GDP, and average total and trade taxes as share of GDP over 1975-2000

Low income countries

Region and country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Replacement rate = Increase in non-trade taxes offsetting decrease in trade taxes	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Contribution rate of trade tax increase to tax loss	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Trade tax contribution to tax increase (or reduction in tax loss)
	Trade tax decrease offset by non-trade tax replacement				**Trade tax decrease AND non-trade tax decrease**				**Trade tax increase**		
Sub-Saharan Africa											
Partial replacement								Tax revenue increases			
Gambia	-1.5 *19.8*	-15.8 *10.0*	91%	Congo, Rep. of	-31.6 *23.2*	-2.0 *3.9*	6%	Lesotho	12.1 *33.9*	4.6 *10.3*	38%
Comoros	-0.2 *11.3*	-9.0 *7.1*	98%	São Tomé & Principe	-20.7 *18.1*	-11.5 *7.9*	56%	Ghana	10.9 *11.1*	1.1 *3.8*	10%
Benin	-3.7 *12.4*	-8.9 *5.4*	59%	Togo	-16.7 *18.6*	-7.0 *7.0*	42%	Chad	5.7 *4.3*	1.0 *1.5*	17%
Côte d'Ivoire	-6.3 *19.0*	-7.2 *6.9*	13%	Nigeria	-12.4 *15.9*	-0.2 *2.4*	2%	Zimbabwe	4.7 *22.7*	3.5 *3.5*	75%
Cameroon	-1.7 *14.8*	-5.9 *3.5*	71%	Mozambique	-10.8 *15.1*	-0.8 *2.6*	8%	Mali	0.5 *12.1*	1.8 *3.7*	374%
Senegal	-5.1 *16.7*	-5.2 *6.6*	2%	Guinea	-9.2 *13.4*	-2.4 *2.1*	26%				
Rwanda	-3.1 *9.8*	-4.9 *3.8*	36%	Madagascar	-7.4 *11.0*	-2.5 *3.6*	34%	Tax revenue decreases Zambia	-5.5 *19.5*	5.0 *4.4*	-47%
Burkina Faso	-1.2 *11.3*	-4.5 *4.1*	73%	Central Afr.Rep.	-6.8 *10.0*	-3.3 *4.3*	49%	Tanzania	-7.0 *15.3*	0.1 *2.0*	-1%
Kenya	-2.4 *23.6*	-3.7 *4.8*	33%	Sierra Leone	-6.7 *12.4*	-4.9 *5.2*	74%				
				Niger	-4.5 *8.7*	-1.5 *3.7*	34%				
Complete replacement											
Uganda	3.9 *8.7*	-3.7 *3.7*	205%	Ethiopia	-3.7 *14.0*	-2.5 *3.2*	66%				
Burundi	3.8 *13.9*	-3.2 *4.6*	216%								
Malawi	3.4 *17.3*	-0.3 *3.7*	1073%								
North Africa & Middle East											
Complete replacement											
Mauritania	0.5 *17.1*	-2.7 *6.5*	117%								
Pakistan	1.4 *12.9*	-1.7 *4.5*	184%								
Asia & Pacific											
Partial replacement								Tax revenue increases			
Bangladesh	-0.8 *8.0*	-1.6 *3.0*	49%					Papua New Guinea	8.4 *18.9*	2.0 *5.3*	23%
Complete replacement								Bhutan	5.3 *6.3*	0.5 *0.2*	10%
Solomon Islands	2.5 *21.4*	-3.8 *12.5*	167%					Nepal	2.8 *7.3*	0.6 *2.6*	22%
								Tax revenue decreases India	-1.1 *9.8*	0.5 *2.9*	-34%
Western Hemisphere											
				Haiti	-6.4 *8.1*	-3.4 *2.5*	53%				

Table D.2. Trend or average adjustments in total taxes and trade taxes as share of GDP, and average total and trade taxes as share of GDP over 1975-2000

Lower middle income countries

Region and country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Replacement rate = Increase in non-trade taxes offsetting decrease in trade taxes	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Contribution rate of trade tax increase to tax loss	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Trade tax contribution to tax increase (or reduction in tax loss)
	Trade tax decrease offset by non-trade tax replacement				**Trade tax decrease AND non-trade tax decrease**				**Trade tax increase**		
Sub-Saharan Africa											
	Complete replacement								Tax revenue increases		
Equatorial Guinea	1.2 *14.7*	-13.4 *7.7*	109%	Egypt	-12.2 *21.6*	-6.0 *5.0*	49%	Morocco	4.0 *21.5*	0.2 *4.6*	5%
Namibia	3.7 *28.6*	-3.6 *5.8*	202%						Tax revenue decreases		
Swaziland	0.1 *28.4*	-0.9 *7.4*	113%					Djibouti	-3.8 *25.9*	0.2 *1.8*	-4%
South Africa	5.6 *22.9*	0.0 *0.4*	39818%					Algeria	-9.0 *14.1*	1.3 *2.2*	-13%
North Africa & Middle East											
	Complete replacement										
Tunisia	1.4 *24.7*	-4.6 *7.0*	130%								
Jordan	6.2 *13.6*	-3.8 *5.9*	264%								
Syria	10.8 *15.7*	-2.4 *2.5*	560%								
Iran	0.3 *8.9*	-2.0 *1.7*	113%								
Asia & Pacific											
	Complete replacement								Tax revenue increases		
Tonga	4.8 *18.0*	-8.7 *8.8*	156%	China	-4.8 *14.9*	-0.8 *1.0*	16%	Maldives	9.0 *14.9*	5.4 *9.4*	60%
Vanuatu	-0.4 *20.0*	-8.3 *14.0*	95%	Indonesia	-4.0 *16.6*	-1.4 *1.1*	35%	Kiribati	7.6 *21.6*	7.0 *13.7*	93%
Sri Lanka	-2.5 *17.3*	-5.3 *5.5*	52%								
Thailand	4.9 *14.5*	-1.3 *3.0*	482%								
Philippines	7.9 *12.8*	-0.1 *4.0*	13161%								
	Partial replacement										
Samoa	-1.9 *27.2*	-12.4 *13.0*	85%								
Western Hemisphere											
	Complete replacement								Tax revenue increases		
Peru	0.7 *13.0*	-3.0 *2.4*	125%	Guyana	-5.4 *32.8*	-4.8 *4.1*	89%	Jamaica	3.4 23.3	1.8 2.2	52%
Honduras	7.3 *15.1*	-2.1 *4.7*	438%					Dominican Republic	3.6 12.8	0.7 5.2	20%
Guatemala	0.9 *7.9*	-1.8 *2.0*	150%					Paraguay	1.5 9.9	0.3 1.8	19%
Colombia	0.5 *10.7*	-1.6 *1.8*	134%								
Ecuador	1.3 *7.8*	-1.3 *2.3*	203%								
Bolivia	15.6 *12.8*	-0.8 *1.6*	2126%								
	Partial replacement										
Suriname	-1.4 *22.3*	-7.6 *7.5*	82%								
El Salvador	-2.2 *10.8*	-4.6 *2.9*	54%								

Table D.3. Trend or average adjustments in total taxes and trade taxes as share of GDP, and average total and trade taxes as share of GDP over 1975-2000

Upper middle income countries

Region and country	Change in Tax Revenue over GDP over 25 years (%)	Change in Trade Tax Revenue over GDP over 25 years (%)	Replacement rate = Increase in non-trade taxes offsetting decrease in trade taxes	Country	Change in Tax Revenue over GDP over 25 years (%)	Change in Trade Tax Revenue over GDP over 25 years (%)	Contribution rate of trade tax increase to tax loss	Country	Change in Tax Revenue over GDP over 25 years (%)	Change in Trade Tax Revenue over GDP over 25 years (%)	Trade tax contribution to tax increase (or reduction in tax loss)
	Average Tax Revenue over GDP over 1975-2000 (%)	*Average Trade Tax Revenue over GDP over 1975-2000 (%)*			*Average Tax Revenue over GDP over 1975-2000 (%)*	*Average Trade Tax Revenue over GDP over 1975-2000 (%)*			*Average Tax Revenue over GDP over 1975-2000 (%)*	*Average Trade Tax Revenue over GDP over 1975-2000 (%)*	
	Trade tax decrease offset by non-trade tax replacement				**Trade tax decrease AND non-trade tax decrease**				**Trade tax increase**		
Sub-Saharan Africa											
	Complete replacement										
Botswana	4.7	-2.9	261%	Gabon	-5.9	-4.6	78%				
	34.6	*4.4*			*27.2*	*5.3*					
Seychelles	5.4	-1.9	379%								
	34.8	*16.1*									
	Partial replacement										
Mauritius	-1.4	-3.4	58%								
	19.0	*9.0*									
North Africa & Middle East											
									Tax revenue decreases		
								Oman	-11.0	0.5	-4%
									10.6	0.8	
Asia & Pacific											
	Partial replacement										
Malaysia	-5.2	-6.0	14%								
	19.7	*4.9*									
Western Hemisphere											
	Complete replacement								Tax revenue decreases		
Barbados	5.0	-4.4	212%	Trinidad & Tobago	-13.4	-1.7	13%	Chile	-8.2	0.2	-3%
	27.6	*3.9*			*27.6*	*1.9*			20.2	2.1	
Belize	0.9	-4.2	122%	Venezuela	-12.4	-0.2	2%	St. Kitts & Nevis	-1.0	1.0	-52%
	20.5	*10.8*			*18.3*	*1.7*			21.3	7.1	
St. Lucia	1.5	-3.4	145%	Panama	-11.0	-0.8	7%				
	22.3	*7.0*			*15.0*	*2.5*					
Uruguay	7.8	-1.7	561%	Dominica	-1.3	-0.9	69%				
	23.1	*1.8*			*25.6*	*4.0*					
	Partial replacement										
Antigua and Barbuda	-0.1	-2.5	95%								
	17.7	*4.3*									
Argentina	-1.0	-1.1	16%								
	11.9	*1.2*									
Costa Rica	-2.0	-5.0	59%								
	13.1	*3.9*									
Grenada	-4.3	-6.9	38%								
	23.5	*5.5*									
St. Vincent & Grenadines	-1.2	-9.4	87%								
	24.5	*6.0*									

Table D.4. Trend or average adjustments in total taxes and trade taxes as share of GDP, and average total and trade taxes as share of GDP o 2000

High income non -OECD countries

Region and country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Replacement rate = Increase in non-trade taxes offsetting decrease in trade taxes	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Contribution rate of trade tax increase to tax loss	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*
	Trade tax decrease offset by non-trade tax				**Trade tax decrease AND non-trade tax**					**Trade tax increase**
North Africa & Middle East										
				Kuwait	-3.3 *2.3*	-0.3 *0.9*	8%			
				Bahrain	-0.5 *7.5*	-0.4 *2.5*	75%			
Asia & Pacific										
	Partial replacement									
Singapore	-1.7 *16.5*	-1.9 *0.9*	9%							
Western Hemisphere										
	Complete replacement									
Bahamas	2.2 *16.4*	-1.8 *10.2*	220%							

Table D.5. Trend or average adjustments in total taxes and trade taxes as share of GDP, and average total and trade taxes as share of GDP over 1975-2000

High incomeOECD countries

Region and country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Replacement rate = Increase in non-trade taxes offsetting decrease in trade taxes	Country	Change in Tax Revenue over GDP over 25 years (%) *Average Tax Revenue over GDP over 1975-2000 (%)*	Change in Trade Tax Revenue over GDP over 25 years (%) *Average Trade Tax Revenue over GDP over 1975-2000 (%)*	Contribution rate of trade tax increase to tax loss
	Trade tax decrease offset by non-trade tax replacement				**Trade tax decrease AND non-trade tax decrease**		
Asia & Pacific							
	Complete replacement						
Korea	3.6	-2.1	272%				
	16.0	*2.0*					
Australia	2.3	-1.0	324%				
	29.8	*1.0*					
New Zealand	6.4	-0.5	1421%				
	35.1	*0.9*					
Japan	4.6	-0.2	2252%				
	27.1	*0.2*					
Western Hemisphere							
	Complete replacement						
Canada	6.0	-1.4	543%				
	34.5	*0.8*					
United States	2.9	-0.1	4465%				
	26.4	*0.3*					
Europe							
	Complete replacement						
Iceland	10.5	-6.4	263%	Luxembourg	-7.0	-0.1	1%
	30.3	*2.8*			*44.1*	*0.1*	
Portugal	8.1	-2.6	414%	Ireland	-1.7	-0.9	51%
	30.9	*1.0*			*34.5*	*0.5*	
Greece	5.9	-2.2	368%	Netherlands	-1.0	-0.3	31%
	31.6	*0.8*			*43.1*	*0.6*	
Spain	16.1	-0.8	2195%				
	30.1	*0.5*					
Austria	5.5	-0.6	944%				
	41.7	*0.4*					
Belgium	3.4	-0.5	721%				
	44.0	*0.5*					
Finland	11.5	-0.5	2380%				
	42.2	*0.3*					
United Kingdom	0.2	-0.5	137%				
	35.7	*0.4*					
Sweden	3.3	-0.5	834%				
	50.9	*0.5*					
Germany	0.2	-0.4	146%				
	37.6	*0.3*					
Switzerland	5.6	-0.4	1605%				
	31.2	*0.4*					
Denmark	10.1	-0.2	4861%				
	46.9	*0.2*					
France	7.2	-0.2	3800%				
	42.6	*0.2*					
Italy	18.8	-0.1	18633%				
	36.6	*0.1*					
Norway	0.0	-0.1	132%				
	42.0	*0.2*					

Appendix E

Estimations of tax capacity

To analyze the importance of structural features in limiting tax yields (tax revenues as a share of GDP) across countries, comparisons of the tax yield across countries will be made taking into account the effects of a number of structural characteristics such as per capita income, the importance of imports, and the relative size of the agricultural sector. These comparisons will be made using standard economic regression techniques, but this analysis will introduce a number of innovations not included in previous studies.[25] These innovations include controlling for (a) the changes in incentives of governments to collect taxes when other sources of revenue such as foreign aid grants or non-tax revenues are available, and (b) the external imbalances of the economy that affect the size of consumption tax bases, such as net inflows of foreign factor income or transfers.

The basic model that will be estimated is

$$T/Y = \alpha + \beta_1 Y_{pc} + \beta_2 (Y_{pc})^2 + \beta_3 X_3 + \ldots + \beta_i X_i + \beta'_3 D_j X_3 + \ldots + \beta'_i D_j X_i + \beta_{i+1} Z_{i+1} + \ldots.. + \beta_j Z_j + \beta_k T + \beta'_k D_j T + \varepsilon$$

The elements of this model are explained in more detail below. In general:

- T/Y is the tax yield (or tax effort) that make up the tax revenues of a central government as share of GDP,
- Y_{pc} is the per capita income of each country expressed in a quadratic of per capita income to allow for the changing impact of per capita income at different income levels,
- X_i are the structural features of the economy that affect the capacity to raise tax revenues,
- D_j are dummies for countries in different income groups to identify whether structural features have different impacts within these different income groups,
- Z_j are the characteristics of other revenue sources affect the incentives to collect taxes, and
- T is time, which is included to capture the net affect of all omitted variables that have a systematic affect on the tax yield over time, and ε is random normal variable that captures the unexplained variations in the tax yield.

This linear specification is the usual specification used and is appropriate as it allows for the independent effects of different structural features. A relationship of the logarithm of tax effort explained by the logarithm of the structural variable assumes that they have multiplicative effects on the tax yield such that improvements in any one structural

[25] A.R.Prest " The Taxable Capacity of a Country" in Toye J.F. (ed), Taxation and Economic Development, London,1979; Richard Goode, *Government Finance in Developing Countries*, Brookings Institution, Washington DC (1984), Chap 4.

feature has a larger impact the more favorable are all other structural features. (See Piancastelli (2001), Ebrill *et al* (2001), and Katusiime (2003))[26].

While some synergies no doubt exist among structural characteristics, it is not necessarily true in all, and certainly not in many important cases. For example, large mining sectors or large share of imports in countries with otherwise unfavorable tax collection characteristics under a multiplicative model would make relatively low impacts on revenue collection performance, but in countries with good revenue collection characteristics they would make large impacts on its revenue yield. While to some extent this may be the case, an economy with generally poor revenue capacity is likely to focus its limited revenue collection resources on the mining sector or import flows, whereas a higher capacity economy may put a more modest effort into collecting from the mining sector or imports given its range of alternative sources. Good tax handles can clearly benefit low-income countries despite otherwise unfavorable tax collection characteristics.

The range of structural features that can be used to explain the tax yield in a country is limited by the availability of data across countries. For example, accountants typically play an important role in compliance with self-assessed taxes such as the income tax and VAT, but data on the number and quality of accountants is not generally available across countries. Another instance is that typically the value added in the agricultural sector as a share of the economy is used to capture the importance of the unfavorable characteristics of this sector on tax collections. The structure of agricultural sectors across countries, however, may vary in ways that impact tax collections. For example, an agricultural sector dominated by large corporate farms producing cash crops is different, tax-wise, from one dominated by small farmers producing food crops. Importantly, the database used here has extensive coverage of central government taxes, but not of other sources of public sector revenues, such as revenues of sub-national governments. These limitations in the data have to be recognized in making cross-country comparisons.

The data used in this analysis is described in Appendix A, which indicates some adjustments to the B&K data set and some of its limitations.

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[26] Piancastelli only presents estimates of tax yield as log-log specification, while Katusiime presents the log-log as an alternative specification. Ebrill et al explain the log $(\theta/(1-\theta)$, where θ is a measure of the revenue ratio, in terms of the logs of explanatory variables.
Marcelo Piancastelli, Measuring the Tax Effort of Developed and Developing Countries, Cross Country Panel Data Analysis –1985/95, IPEA, Rio Janeiro, Brazil, 2001
Liam Ebrill, Michael Keen, Jean Paul Bodin and Victoria Summers, *The Modern VAT*, International Monetary Fund (2001)
Frank M. Katusiime, "Measuring Tax Performance among Esat African Countries'" URA Fiscal Bulletin, Vol 2 (no 1) June 2003, pp 1-50

Table E.1 Estimates of tax capacity (Taxes as a share of GDP) across 123 countries, 1975-2000

Variable	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*
Constant	28.259	*62.03*	122.380	*2.88*	125.687	*3.64*	19.055	*0.35*	18.843	*14.08*	16.628	*9.46*
Agruclture as share of GDP	-0.101	*-2.39*	0.324	*8.66*	-0.100	*-2.41*	0.197	*3.10*	0.132	*1.26*	0.337	*2.33*
Agruclture as share of GDP*LIC	-0.311	*-7.71*	-0.432	*-12.87*	-0.096	*-2.16*	-0.412	*-6.16*	-0.345	*-3.71*	-0.506	*-3.96*
Agruclture as share of GDP*LMIC	-0.452	*-10.38*	-0.486	*-13.55*	0.008	*0.17*	-0.124	*-1.82*	-0.463	*-4.93*	-0.629	*-4.76*
Imports of goods as share of GDP	-0.024	*-2.43*	-0.045	*-5.72*	0.053	*6.49*	0.060	*5.89*	-0.098	*-6.34*	-0.021	*-1.14*
Imports of goods as share of GDP*(LIC+LMIC)	0.070	*5.37*	0.210	*16.55*	0.112	*8.56*	0.087	*5.29*	0.187	*6.63*	0.210	*5.18*
Foreign transfers and income as share of GDP			-0.032	*-0.87*	0.052	*1.69*	-0.060	*-1.65*	0.306	*2.32*	0.589	*3.53*
Foreign transfers and income as share of GDP*(LIC+LMIC)			0.023	*0.59*	-0.078	*-2.40*	0.067	*1.70*	-0.175	*-1.30*	-0.499	*-2.97*
Mining sector as share of GDP							0.011	*0.62*			0.273	*4.71*
Mining sector as share of GDP*(LIC+LMIC)							0.080	*2.47*				
Grants and other income as share of GDP									-0.152	*-2.96*	-0.499	*-2.97*
GDP per capita			0.001756	*22.99*	0.00058	*4.77*	0.000702	*3.85*	0.001315	*7.94*	0.000349	*3.83*
GDP per capita squared			-2.82E-08	*-11.46*	-9.44E-09	*-3.32*	-1.43E-08	*-3.11*	-1.7E-08	*-3.65*		
Year			-0.055	*-2.58*	-0.062	*-3.57*	-0.010	*-0.36*				
Year*LIC					0.005	*6.37*	0.007	*6.23*				
Year*LMIC					0.005	*7.12*	0.004	*4.72*				
Year*UMIC					0.008	*17.35*	0.007	*13.67*				
Year*Indust					0.014	*32.01*	0.015	*26.24*				
Asia&Pacific					2.280	*5.86*	1.618	*3.10*				
Sub-Saharan Africa					6.213	*15.91*	6.773	*13.56*				
Sample Size	2518		2493		2493		1485		559		229	
Adjusted R squared	33.3%		58.6%		73.2%		75.8%		53.7%		49.0%	
F -statistic	252.78		354.29		427.42		258.64		65.68		22.90	
Mean of dependent variable	21.06						21.80		19.38		18.23	
Standard deviation of dependent variable	10.95						11.39		9.76		8.18	

Table E.2 Estimates of tax capacity (Taxes as a share of GDP) across 74 low- and lower-middle-income countries, 1975-2000

Variable	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*	Coefficient	*t-statistic*
Constant	14.911	*32.79*	168.297	*4.02*	183.960	*4.51*	19.432	*15.52*	17.455	*9.55*	18.703	*6.86*
Agruclture as share of GDP	-0.121	*-5.97*	-0.090	*-3.43*	-0.120	*-4.58*	-0.116	*-3.48*	-0.195	*-3.50*	-0.136	*-1.64*
Agruclture as share of GDP*LIC	-0.040	*-2.26*	-0.115	*-3.71*	-0.080	*-2.63*	-0.118	*-4.38*	-0.003	*-0.06*	-0.111	*-1.63*
Imports of goods as share of GDP	0.143	*15.14*	0.175	*15.57*	0.050	*2.41*	0.146	*10.82*	0.135	*4.83*	0.155	*2.67*
Imports of goods as share of GDP*LIC	0.051	*4.20*	0.038	*1.78*	0.156	*14.12*	0.067	*3.00*	0.056	*1.62*	0.156	*2.24*
Foreign transfers and income as share of GDP			-0.048	*-3.09*	-0.051	*-3.37*	-0.072	*-2.28*	0.087	*1.41*	0.141	*1.13*
Foreign transfers and income as share of GDP*LIC			0.005	*0.22*	0.009	*0.40*	0.050	*1.34*	-0.029	*-0.41*	-0.156	*-1.17*
Mining sector as share of GDP							0.101	*3.78*			0.216	*3.05*
Grants and other income as share of GDP									-0.216	*-4.28*	-0.430	*-6.11*
GDP per capita			-0.003278	*-4.33*	-0.002051	*-2.74*	-0.006052	*-6.34*	-0.001747	*-1.09*	-0.004757	*-1.91*
GDP per capita squared			9.350E-07	*5.57*	4.350E-07	*2.52*	1.340E-06	*6.40*	8.330E-07	*2.23*	1.380E-06	*2.66*
Year			-0.077	*-3.65*	-0.085	*-4.13*						
Year*LIC			0.001	*1.43*	-0.001	*-1.74*						
Asia&Pacific					0.896	*2.16*						
Sub-Saharan Africa					4.297	*9.00*						
Sample Size	1467		1459		1459		836		367		152	
Adjusted R squared	37.0%		39.4%		42.9%		44.6%		48.8%		70.2%	
F -statistic	216.5		95.6		92.4		75.6		39.8		36.5	
Mean of dependent variable	15.78				15.75		16.37		16.38		17.60	
Standard deviation of dependent variable	6.84				6.81		7.29		6.94		7.93	

Appendix F

Malawi: A case of ineffective high standard surtax rates[27]

The VAT is often viewed as a major source of potential revenue enhancement to replace revenues as trade taxes are reduced and, even more generally, to reduce government deficits. While a broad-based VAT in developing countries can be expected to increase its tax yields over time as tax compliance improves and the formal sector expands as a share of an economy raising the effective size of the VAT base, in the medium term, increased VAT rates have to be considered as a method of enhancing VAT yields. Currently, standard VAT rates among SADC Member States range from 10% to 20%. Raising VAT rates in the countries with standard rates at the lower end of this range represents a credible way of gaining significantly increased yields, but for countries at the top end of the range, raising rates can be expected to yield only limited additional revenues.

Malawi provides an interesting case study of the revenue effects of varying the standard tax rate in the range above 20%. Malawi, in the latter part of the 1980s, raised its sales tax rates significantly in an attempt to close its budget deficit. It also undertook a major tax reform program, which included the conversion of its sales tax, known as the "surtax," to a destination-based, credit-method VAT in 1989. It retained the name of the tax as the "credit-method surtax" and kept the point of the tax at the manufacturing level. Prior to the introduction of the credit method structure, Malawi had raised its standard surtax rate from 20% to 25% in 1984/85 and again to 30% in 1985/86. See Table 6.10. At that time, the surtax rate on imports was also 20% higher than the surtax rate on domestic supplies (for example, a 20% domestic rate was charged at 24% on imports), but the large majority of the surtax revenues were collected on domestic sales given imported raw materials and capital equipment where exempt inputs by registered traders before the credit method was introduced. As part of the tax reforms, in 1987 the standard rate on imports and domestic supplies was made uniform, but raised again to a peak of 35%. With the introduction of the credit method in 1989/90, however, the surtax rate was lowered to 30%, and then furthered lowered every two years subsequently back down to 20% by 1993/94.

The remarkable feature of this roller-coaster tax rate ride that was that the revenue yield as a share of GDP only rose modestly from about 4.6% prior to the rate increases to a peak of about 6%, and then only declined to 5% as the standard surtax rate dropped from 35% back to 20%. Interestingly, the revenue yield stayed in a tight range of 5.3% to 6% of GDP as the rate varied between 25% and 35%.

[27] Repeated from Graham Glenday, "Assessment of the Current State of VAT Implementation in SADC Member States" Report prepared for the Trade, Industry, Finance and Investment (TIFI) Directorate of the Southern African Development Community, November 30, 2005, Chapter 6, pp76-78

Table 6.10. Surtax rates and revenues, Malawi 1982/83-1993/94

Fiscal years[a]		Standard Surtax Rate (Rate on imports)	Average Surtax Revenue[b]/GDP
From	To		
1982/83	1983/84	20% (24%)	4.56%
1984/85		25% (30%)	5.31%
1985/86	1986/87	30% (36%)	5.54%
1987/88	1988/89	35%	5.90%
1989/90[c]	1990/91	30%	5.96%
1991/92	1992/93	25%	5.44%
1993/94	2000/01	20%	4.95%

a. Fiscal year is ends on March 31

b. Includes Accommodation and Refreshment Tax which was incorporated into Surtax in 1993/94

c. Credit method surtax introduced in 1989/90

Source: Ministry of Finance data

This suggests that the price responsiveness of the surtax base was high. In fact, it appears that the standard surtax rate rose into the range of the maximum revenue yielding tax rate for the surtax base.

These observations can be analyzed somewhat more formally by considering the price effects of raising sales tax rates on the size of the effective tax base of a consumption tax. Considering the case of constant cost supply, the revenue yield can be expressed in terms the tax base, the tax rate and the price elasticity of demand[28] as follows:

$$R/Y = (pQ/Y)t(1+\eta t) \qquad (1)$$

where : R/Y = *surtax revenue yield or revenues as a share of GDP* (Y)

pQ/Y = *value of taxable sales as a share of GDP without tax in place*

t = *standard surtax rate*

η = *price elasticity of demand of taxable goods at the price and quantity without tax*

For the revenue yield to fall from 6% to 5% of GDP as the tax rate is reduced from 35% to 20% requires a high price elasticity of demand of around –1.5. Typically for a broad-based tax such as a VAT, where most of final consumption is targeted, the price elasticity of the bundle of all taxable goods is expected to be close to –1, as this implies that total consumption will remain at the same expenditure value as the tax rate or price increases. If the price elasticity of demand for taxable goods had been about –1 in Malawi, then the surtax revenues would have risen to about 7% of GDP (rather than 6%) when the

[28] Price elasticity of demand (η) is defined at the prices and quantities that be traded without the tax in place as given by p and Q. The demand curve is assumed to be approximated by a straight line over the range of tax rates applied.

standard rate was raised to 35%. It is also of interest to note that at the high price elasticity of demand of –1.5, the maximum revenue yield would be reached at a tax rate of 33%. The tax rate yielding the maximum revenues is given $-1/(2\eta)$. This is consistent with the revenue yield in Malawi remaining nearly invariant as the surtax rate was varied in the range of 30% to 35%.

What are some possible reasons for the price elasticity of demand being high and, therefore, variations in the revenue yield being dampened as the Surtax rate changed? First, if the tax base exempts a large share of consumption, particularly unprocessed foodstuffs that make up a high share of consumption particularly of the poor, then the elasticity of demand for the remaining taxed goods can be higher than one**.** Similarly, exemption of a wide range of services and the prevalence of a large informal sector, with turnover rates falling below the minimum turnover level, and large non-monetary sector further restrict the taxable base of sales.

The smaller the tax base and with more "luxury" goods that were included in the base (as opposed to the exempted necessities such a unprocessed food), the feasibility and expectation of a high price elasticity of demand rises with the significant possibilities for consumption substitution to untaxed goods and services. Moreover, a small share of luxury goods were subject to high tax rates above the standard surtax rate. If these high-tax rate items are substitutes for goods at the standard rate, then the price elasticity of goods at the standard rate would be higher, as when the standard rate was raised increased luxury surtaxes would be collected masking the decline in revenues from goods at the standard rate. Furthermore, tax compliance is expected to decline as the incentives for tax evasion rise with the very high standard tax rates of 30% and above. This would result in an increase in the effective price elasticity of demand for taxable goods being observed.

It is important to recognize that the Malawi surtax rate changes occurred without any systematic reduction in the average tariff rates charged on imports that would have resulted in lower domestic prices and offset the increases in the surtax rates. Tariff rates during the late 1980s and early 1990s were both decreased and increased. Effective import duty collections averaged around 3% of GDP throughout this period. If tariffs are systematically being reduced and replaced with higher consumption tax rates, then it is less certain that any increased consumption tax rates will cause any increase in prices. The squeezing of the tax base in response to tax-induced price increases, as discussed above, will not occur if the duty rate reductions offset the surtax or VAT rate increases.

Summary

High price elasticity of demand in conjunction with a narrow tax base (less than 50% C-efficiency, for example) can lead to tax rate increases being an ineffective tool to achieve significant revenue increases when the standard rate is already high. Both tax base widening and effective administration are required to enhance revenues directly and indirectly to support higher revenue yields from tax rate increases. The direct revenue effects will arise from the effective base broadening. The indirect effects will come from the lower price elasticities of demand of a broader tax base.